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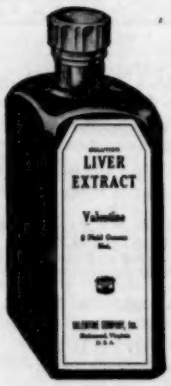

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ADDRESSES AND ORIGINAL ARTICLES

CHRONIC MASTITIS *

By H. J. B. Atkins, D.M., M.Ch. Oxon., F.R.C.S. Eng.

ASSISTANT SURGEON TO GUY'S HOSPITAL

For the purposes of this paper "chronic mastitis" may be defined as any painful or nodular lesion of the breast not due to new growth, bacterial inflammation, or fat necrosis. Chronic mastitis is a very common but mysterious disease. We are almost entirely ignorant of its pathology, its life-history is only vaguely understood, and its treatment is unsatisfactory. Not only do we not know the cause of or the treatment for chronic mastitis, but the evidence on which the study of these two aspects of the disease must be based is so contradictory that it is difficult to present a picture of the disorder with as much as the broad outlines filled in.

It is probable that there is more than one cause of pain in the breast in chronic mastitis, it is possible that there is more than one cause of nodularity, and ever since the disease was first described till the present day, attempts have been made to classify different types of chronic mastitis from an ætiological, clinical, or histological point of view. Although a classification is desirable, none of the existing classifications is entirely satisfactory, and in any attempt at a too rigid classification there appears to be a danger of losing sight of the wood for the trees. Whilst admiring the work of Sir Lenthal Cheatle and Max Cutler (1931), I have been unable to convince myself of the truth of their main thesis, that there are two distinct types of chronic mastitis, the cystic (or cystophorous desquamative epithelial hyperplasia) and the non-cystic (or mazoplasia). Again, it is doubtful whether the histological division into epitheliosis and adenosis represents a real distinction between two separate entities. I shall therefore discuss the painful and nodular breast as a whole with what I hope is not a too ruthless disregard for the traditional avenues of approach.

THE CAUSES OF PAIN IN THE BREAST

Before discussing the causes of pain in chronic mastitis the question of differential diagnosis must be mentioned. At the mastitis clinic at Guy's Hospital cases of post-herpetic neuralgia, cholecystitis, and cardiac disease have been referred to me for treatment, and these conditions must be borne in mind. When such extraneous causes of pain can be excluded I believe that the following factors are usually concerned in varying proportions in different cases.

First, there is the *endocrine factor*. The evidence for this is that the pain occurs almost entirely in women, is often aggravated a few days before the menstrual period, and in most cases disappears during pregnancy. Further evidence in this direction is the effect, to be described later, of the injection of certain endocrine preparations.

Secondly, I suspect that there is what, for want of a better term, may be called a "*neuralgic*" *factor* in many of these cases of breast pain. Velpeau (1856) was the first to suggest this in so many words, and Astley Cooper (1829) observed the baneful effect of cold, damp weather. Many of my cases—though by no means all—have noticed this effect and proffer the information spontaneously. The distribution of the pain and tenderness is often suggestive of neuralgia, being along the course of one or two intercostal nerves; and any factor which might irritate these nerves, such as the drag of pendulous breasts, aggravates this pain. The therapeutic value of diathermy in many cases is possibly related to the neuralgic quality of the pain.

Lastly, there is the *psychological factor* which may cause sensations in the breast to be interpreted as pain, and pain in the breast to be interpreted as agony. All who have had to deal with chronic mastitis are impressed by the importance of the psychological aspect. Every woman knows that the breast is a common site for cancer. Sensations of some sort occur in the breast of most women at, or just before, the menses. In addition the normal breast feels different from the surrounding subcutaneous tissue, and the lateral border of the tail of the breast or the rolled suspended border often suggests a lump. Here then we have a ground upon which the seed of psychological pain is readily sown. My own impression of many of these patients is the same as that of Sir Astley Cooper (1829), that they are of an irritable and suggestive nature. The beneficial effect of reassurance is stressed by Velpeau (1856), and this again has been most pronounced in the cases with which I have had to deal.

In assessing the value of different methods of treatment I have resorted, as will be mentioned, to the injection of inert substances, such as olive oil, in a control series of cases, and the effect in some of them has been so remarkable as to suggest to anyone unaware of the composition of the material injected that it was a specific antidote for the disease.

CAUSE OF NODULARITY OF THE BREAST

The relation between nodularity and pain in the breast is by no means clearly understood. In an article on this subject published a few years ago such statements occurred as: "Out of 500 cases examined 144 showed nodularity of the breast." This statement is meaningless. Most breasts are nodular (compared with the surrounding subcutaneous tissue) although some are more so than others, and most breasts are more nodular at one period of the menstrual cycle than at another. It is, therefore, fruitless to consider such pronouncements as, "56 per cent. of painful breasts are nodular," or "19 per cent. of nodular breasts are painful," without defining what is meant by "nodular" with a degree of precision which is unattainable.

Numbers of patients complaining of pain in the breast show no greater degree of nodularity than other patients examined as controls not complaining of pain in the breast.

Mr. E. C. Hughes, my senior colleague at Guy's Hospital, has examined for me the breasts of fourteen patients, seven of whom were attending the mastitis clinic and the other seven were selected haphazard from the general medical wards. He was asked to say, from palpation of the breast, which patients he considered were attending the clinic. As a result of his examination he made a list in which the patients were placed in order of nodularity of the breast; the list was as follows (M. = attending the mastitis clinic, C. = control): M.; C.M.; M.; C.; C.; C.C.; M.; M.; M.; C.M.C.

In this small series it was thus impossible to judge from an examination of the breast which patient was likely to complain of symptoms. The implication is that nodularity is a normal property of breast tissue and that the predominant feature of chronic mastitis from the clinician's point of view is pain. Only those patients in whom the nodularity of the breast is exceptionally noticeable, either because it is

* Hunterian lecture delivered at the Royal College of Surgeons on Feb. 7th.

excessive or because it is localised and forms a well-marked lump, will consult their doctor for lumpiness if pain be absent.

Despite this, my impression is that there is some relation between nodularity and pain in the breast; apart from those patients who come up complaining of lumpiness in the breast, I believe that the patients who complain of pain possess on the whole breasts which are more nodular than those who do not complain of pain. Nodularity and pain in the breast are associated, but not so closely or so regularly as is generally supposed.

The cause of nodularity in the breast is thought to be endocrine for the following reasons:—

It occurs almost exclusively in the female breast, it increases just before each menstrual period, and it is aggravated by the injection of certain endocrine preparations. It will be seen that the nodularity behaves in regard to hormonal effect very much as what we have called the endocrine factor in pain. That is, both are pronounced at the same period in the menstrual cycle and both are affected together by the injection of the same endocrine—the ovarian hormone œstrin. On these grounds it is believed that excess of œstrin, an abnormal quality of the œstrin elaborated, or an abnormal response on the part of the breasts to œstrin may be responsible for the nodularity and part of the pain in this disease. But because the injection of a certain substance aggravates a condition, it does not necessarily imply that it is the cause of it.

From these considerations it would appear that chronic mastitis is primarily an endocrine disorder; that this endocrine imbalance is responsible for structural changes in the breast and also for sensations which are either barely appreciated, mildly unpleasant, or painful, depending upon the extent to which the other pain factors are present. That some very nodular breasts are not painful is due, I believe, to the fact that the endocrine factor is the least important of the three pain factors, and where the other two are not operating the pain is absent or negligible.

IS CHRONIC MASTITIS PRECANCEROUS?

We now turn to the much debated problem of the possibility that the painful nodular breast is precancerous. Here there are three avenues of approach—the histological, the clinical, and the experimental; and there would seem to be an irreconcilable cleavage of opinion between the clinician on the one hand, and the histologist and experimental pathologist on the other regarding this problem. I shall deal first with the histological point of view, championed pre-eminently by Cheatle and Cutler (1931).

Briefly, the histological changes met with in the nodular breast are as follows: There is a hyperplasia and desquamation of the epithelial cells lining the ducts and some of the alveoli. The ducts dilate, coalesce, and form cysts. Into these cysts papillomatous processes of epithelial tissue may project. The interstitial fibrous tissue is increased and there is, into this tissue, an infiltration of small round cells. Cheatle and his school of histologists attempt to trace the life-history of the intracystic papillomatous projections, and they maintain that they can illustrate a complete series of events, starting with these innocent papillomata and ending with the appearance of malignant neoplastic cells (Figs. 1–9).

Such is the type of evidence upon which the histologist of this school maintains that mastitis is liable to lead to cancer. There are, however, two objections to this view. Firstly, histology takes a cross-section in the life-history of a group of cells and represents them in static form. There is no evidence that the order, chosen arbitrarily by the histologist, represents the sequence in the life-history of such cells. To take an extreme and somewhat absurd case, it might be argued equally that the normal breast develops from carcinoma by showing this series of photomicrographs in their reverse order. Secondly, even if this sequence be true, there is still no evidence that cancer cannot be grafted equally well on to the earlier stages of the sequence as the later. The histologist says in effect: "If cancer follows mastitis, this probably is the way in which it does so, and by showing you a possible way I have demonstrated that chronic mastitis is a possible precursor of cancer. More than this I cannot say."

When we consider the point of view of the clinician, we find among clinicians a remarkable agreement that chronic mastitis is not a precancerous lesion. In fact Bloodgood (1934), whose figures in relation to this point are more comprehensive than any others, began by studying mastitis as a histologist, and considered that it was a precancerous disease. When he observed mastitis from the clinical standpoint he completely changed his opinion and became one of the most ardent advocates of the view that the painful nodular breast was not potentially malignant. Bloodgood's series of many hundred cases of mastitis was followed up for a number of years, and he believed that the incidence of cancer of the breast in this series was not greater than the incidence in the general population. Later workers have supported these findings, and the impression of most surgeons of experience agrees with them.

There are objections to the deduction of final conclusions from the observations of Bloodgood and his school which must be mentioned. No reliable series has been followed up for more than ten years, and if cancer does appear after mastitis it does so probably after a longer period than this. Further, many of the cases in these series were subjected to operation for the removal of a localised lump—a lump in which the germ of cancer may have resided. Lastly, the clinician deals mainly with the breast which is predominantly painful, and we have seen that the relation between the painful breast and the nodular or structurally abnormal breast, with which the histologist deals, is by no means as close as has often been supposed. To this extent the clinician and the histologist are dealing with somewhat different material and are liable to come to different conclusions. For all that, the only reliable method of telling whether a disease A predisposes to a disease B is to take a large number of cases of A and follow them up for a long period, noting whether the disease B occurs in a greater proportion in these than in the general population. No indirect evidence however suggestive, from the histologist, can shake the validity of such an observation thoroughly carried out. It may be said that this observation has *not* yet been thoroughly carried out, for the reasons given above, and therefore we must say that scientifically we do not know whether the painful nodular breast predisposes to cancer. On the other hand, we can say fairly that sufficient of this type of evidence has been collected for us to assume that if this precancerous tendency does exist, it is so slight that there is no justification for removing the painful nodular breast—where the diagnosis of chronic mastitis is certain—in order to prevent the onset of cancer.

EFFECT OF ENDOCRINES ON THE BREAST

We come now to the work of the experimental pathologist. If the position outlined already has

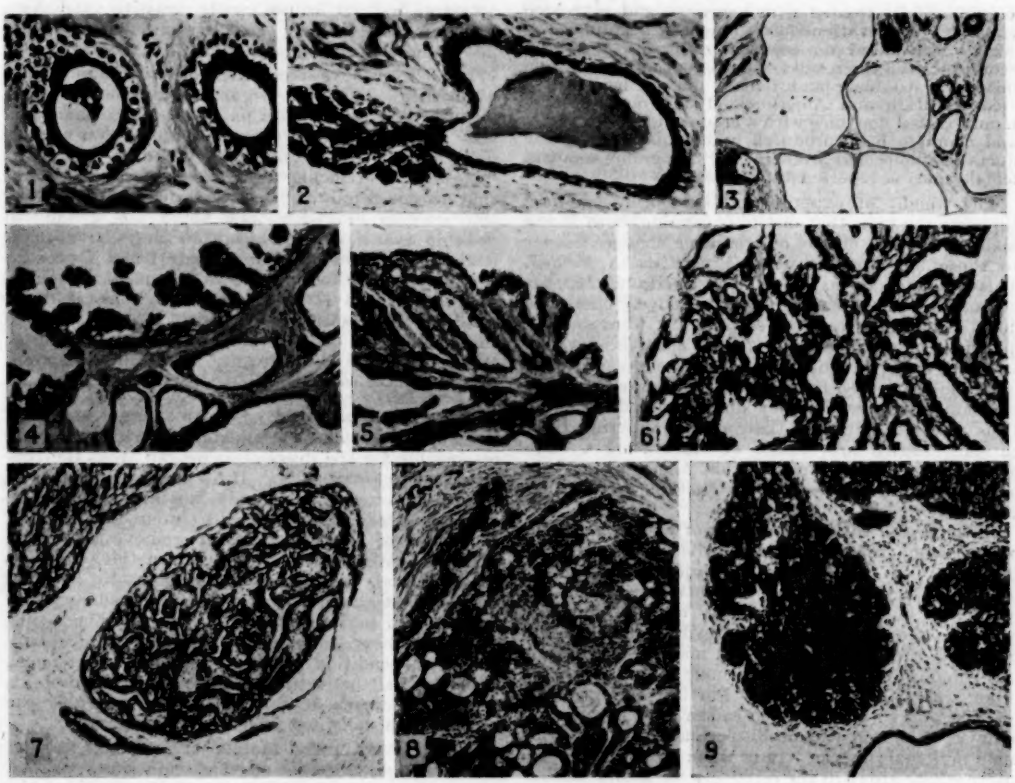

FIG. 1.—A number of ducts undergoing dilatation. The epithelial cells lining these ducts are elongated and are being shed into the lumen. The interstitial fibrous tissue is increased. (High power.)

FIG. 2.—A later stage. A dilated duct in communication with an unaltered alveolus contains the débris of desquamated cells. The lining of this duct is composed of epithelial cells which are becoming flattened. (Low power.)

FIG. 3.—A number of ducts have undergone dilatation. They are tending to coalesce. The epithelium is of the flattened "pavement" variety. (Low power.)

FIG. 4.—Papillomatous processes of epithelium project into some of the cysts. (Low power.)

FIG. 5.—Papillomatous projections have in places fused at their tips and form an arcade. The supporting stroma of these papillomata is increased. (Low power.)

FIG. 6.—The papillomata have grown towards the centre of the cyst and the fusion of their apices gives rise to the well-known "cart-wheel" arrangement. The cystic spaces are reduced to irregular clear areas between the epithelial projections. (Low power.)

FIG. 7.—From a patient complaining of bleeding from the nipple. A well-developed duct papilloma occupies nearly the whole of two cysts, the cystic spaces being reduced to mere slits. (Low power.)

FIG. 8.—A duct carcinoma in which the epithelial cells have crowded out almost all the other elements and there is a tendency for them to migrate into the surrounding tissue. (Low power.)

FIG. 9.—The cysts are crammed with spheroidal cancer cells to the exclusion of all other tissue elements. Part of an "empty" cyst is also shown. (Low power.)

seemed confused and contradictory, the work of the experimental pathologist has, if anything, made confusion worse confounded. This work is, however, of importance and must be taken into our reckoning.

The chemical structure of œstrin is very similar to that of the carcinogenic hydrocarbons, and it has been suggested that œstrin may therefore be carcinogenic—a hypothesis which finds certain support from experimental injection of œstrin into animals. On the other hand, progesterone and testosterone are in structure equally similar to the carcinogenic hydrocarbons, and so far neither of these substances has been shown to be carcinogenic experimentally. So that the argument, from structural analogy, that œstrin may be carcinogenic does not carry much weight.

The argument from the effect of œstrin injection into animals is, however, worthy of the closest examination.

This problem has been studied by Lacassagne (1932, 1933, 1934, 1936) and Burrows (1935). The effect of œstrin administration to mice and rats can be examined from two different though related standpoints: first, the contention that œstrin causes changes in the breast of experimental animals similar to those met with in mastitis in women, and secondly, that a prolonged administration leads to cancer. The difficulty in interpreting the results of these experiments, particularly the production of cancer by œstrin, lies in the fact that the effect is more obvious when male animals are used, and the problem arises as to whether œstrin does more than convert the male breast into a female one, and so render it liable to those changes which arise spontaneously in the female breast.

I shall deal with this difficulty first in relation to the alleged property of œstrin to cause mastitis. Burrows has established beyond all reasonable doubt that the administration of œstrin to male mice causes changes in the breast similar to those occurring in chronic mastitis in women. He states, however, that "Female mice have not been introduced very much into the discussion because there is not such a clear distinction to be seen in the mammæ of females

between those treated with œstrogen and untreated controls. Observations have, however, been made on female mice, and no essential difference has been found between the results of persistent administration of œstrin to male and female mice respectively." Goormaghtigh and Amerlinck (1930), on the other hand, treated doe mice with a crude extract of œstrin, and claim to have produced cystic dilatation of the ducts and epithelial proliferation. A similar result in female mice is reported by Lacassagne (1936).

The weight of experimental evidence, therefore, supports the view that œstrin is capable, both in the male and female mouse, of producing changes similar to those met with in chronic mastitis in women. This is not to say that œstrin causes chronic mastitis in women. In these experiments relatively enormous doses of œstrin were used, so that if it were solely a question of œstrin excess causing mastitis, patients suffering from this disease would be expected to be found suffering also from other signs of gross œstrin poisoning, signs which they do not usually display. It is possible, however, that women suffering from chronic mastitis may either be elaborating a toxic product allied to œstrin or that their breasts are particularly sensitive to the action of normal œstrin.

In connexion with the problem of the carcinogenic properties of œstrin, the position is even more confusing. It is certain that the injection of œstrin into male mice of a strain the females of which are peculiarly liable to spontaneous cancer, produces cancer in these male breasts. But here, as has been indicated, the injection of œstrin may merely change the "male" breast into a "female" one, which is, in any case, liable to cancer. Further, there appear to be strains so refractory to cancer that no amount of injected œstrin will produce cancer in either the male or female breast. It is when we come to the intermediate group of the relatively refractory strains that difficulties of interpretation arise. Attempts have been made to show that injection of œstrin in these relatively refractory strains increases the incidence of cancer of the breast, and if this property of œstrin can be proved, it is a very convincing step in establishing the carcinogenic power of œstrin, at least when very large doses are administered over long periods. Mice, however, show a refractoriness to cancer depending not only upon the strain to which they belong, but, according to Burrows (in a private communication), depending upon certain circumstances under which they are housed and allowed to mix freely together. As these factors in the production of refractoriness have only just been appreciated and have not yet been worked out, experiments on so-called relatively refractory strains are of but little value. We must first learn why they are refractory before we can interpret the effect of œstrin injection upon them. Even if these experiments eventually established the carcinogenic property of œstrin under these circumstances, it is still doubtful whether any advance will have been made as to our knowledge of the cause of breast cancer in man, because it does not seem likely that these relatively enormous quantities of œstrin ever circulate in man, although it might be true that in highly susceptible human stock a moderate excess of œstrin, acting over a long period, would favour the appearance of cancer of the breast.

The proof of the validity of these experiments is important, however, from our point of view because if œstrin does cause cancer of the breast in mice it appears to do it via the stage of cystic and epithelial changes in the ducts, which are similar to those met with in chronic mastitis in man. That is, œstrin appears first to cause cystic mastitis and then carcinoma, suggesting that cystic mastitis is a precancerous disease.

How are we to reconcile this with our clinical experience? The same arguments can be employed against the experimental pathologist who maintains that cystic mastitis is a precancerous lesion as were used against the histologist. We may say again, "However convincing your arguments appear to be that disease B follows disease A, you are approaching the problem indirectly, and there are a hundred possible fallacies for which you may have made inadequate allowance. For my part I find in practice that disease B follows disease A sufficiently infrequently for me to treat disease A as if there were no increased probability that disease B should follow."

TREATMENT

There are two ways in which the problem of treatment can be approached. We can attempt to redress the supposed endocrine imbalance, which may be responsible for the disease, or we can treat the condition symptomatically. If it could be shown in clinical practice that chronic mastitis were a precancerous lesion, then it would be our duty to treat the cause of the disease or to remove the organ involved. We should have to regard the symptoms as a helpful index of our progress—to be kept unmasked as assiduously as the pain and rigidity in a case of peritonitis that we are watching. But if, as we believe, chronic mastitis is not a sufficiently dangerous condition to warrant surgical interference, then we shall be justified in relieving the symptoms and in the words of Astley Cooper "returning the patient with delighted affection to her family."

In regard to the first method of treatment, various observers have tried the effect of endocrines. With a disregard for the implications of the work of the experimental pathologist which we may, or may not, regard as justifiable, the endocrine chiefly used has been œstrin—the very substance which, in its original form or in some abnormal form, is considered by many to be the cause of the disease. The rationale for the use of this substance is as follows: It is known that the symptoms of chronic mastitis worsen a few days before the onset of the menstrual period, at a time when the blood œstrin is low. It is known, too, that the disease practically disappears in the middle and later months of pregnancy when the blood œstrin is very high. Can it be that the lack of œstrin just before menstruation is responsible for the worsening, and the increased œstrin during pregnancy responsible for the improvement of the condition at these times? This line of reasoning unfortunately takes no account of the œstrin actually in the tissues, and this is more likely to be the important factor. To take an analogy in bone surgery: if our only method of investigation of a case of generalised osteitis fibrosa were the blood chemistry, we might look upon generalised osteitis fibrosa as a disease due to excess calcium, because an excess of calcium is found in the blood; whereas, we know, because calcium salts are opaque to X rays, that the disease is characterised by a lack of calcium in the bones, and the blood calcium is only high because the blood is working to capacity conveying calcium out of the bones and unloading it in the kidneys, whence it is excreted. It is quite possible that the same type of activity is occurring with regard to œstrin at the time of menstruation and during pregnancy. Unfortunately, œstrin is not, like calcium, opaque to X rays; nor are the methods of tissue œstrin estimation

sufficiently advanced to be reliable. We must remember, however, that at times when the blood œstrin is high, the tissue œstrin may be low, and vice versa. The analogy with calcium can be pressed further in that it is thought that there are active and inactive forms of œstrin circulating in the blood, and œstrin estimation, like calcium estimation, takes cognisance only of the total material present and makes no distinction between what is active and what is inactive.

However ill-founded the rationale of this treatment may be, it is necessary, in view of the claims which have been made for it, to examine the effect of œstrin administration on patients suffering from chronic mastitis. Without being too sweeping it can be said that all the early attempts at treatment with ovarian residue are without significance as far as œstrin is concerned in that the amount of pure œstrin administered was too small to be effective.

A number of workers have given purified œstrin by mouth and by injection. I have had the opportunity of seeing the results of a large series of cases treated in this way in the United States, and was convinced that a high proportion of these cases was relieved of their symptoms. With the collaboration of my colleague, Dr. P. M. F. Bishop, and with the help of a grant from the British Empire Cancer Campaign, I have investigated the effect of œstrin injections in relatively high doses upon patients attending the mastitis clinic at Guy's Hospital. These experimental injections were carefully controlled with a parallel series receiving injections of sterile olive oil, and those which received oil were later given œstrin.

The technique of œstrin injection followed that commonly employed in the United States and was as follows: A dose of 10,000 international units of Dimenformon was injected intramuscularly twice a week for the first half of the intermenstrual period, and in some cases the same dose, or even higher doses, was administered throughout the intermenstrual period. These experiments are now continuing and when completed will be published in detail, but Dr. Bishop and I are satisfied in our own minds that the injection of sterile olive oil is as effective as the preparations of œstrin which we have used. We believe that œstrin injections may be harmful, an opinion which is strengthened by the fact that some of our patients, especially those receiving higher doses than 10,000 units, seem to be slightly worse as a result of their injection. The consequent increase in pain and nodularity is particularly marked some hours after each injection. It cannot, therefore, be too strongly emphasised that the psychological element in this disease is so important and the natural variations in nodularity so common that, in assessing the value of any therapeutic agent, it is essential that the most rigorous control should be exercised, otherwise any method of treatment may be hailed as a specific.

Similar claims with regard to testosterone (the male extract derived from the testis) have been made by Desmarrest and Capitain (1937). The rationale for this treatment is exactly the reverse of that for the use of œstrin. It is based on the supposition that in chronic mastitis œstrin is the villain of the piece and that testosterone is its natural antagonist. That this may be a mistaken supposition in regard to the breast is suggested by the work of Selye, McEuen, and Collip (1936), who show that testosterone injected into the experimental animal tends to produce a histological picture in the breast similar to that produced by injected œstrin. However, we are at present testing this substance on the same lines as those which we have used for œstrin, but our experiments in this direction have not advanced far enough for us to be able to express any opinion about them.

With regard to the use of endocrines in the treatment of chronic mastitis, let me refer to the views of William Rowley, expressed in 1793, "It is the duty of medical practitioners . . . to reason and judge candidly and make repeated trials of whatever may be concluded safe." Is the wholesale administration of these highly active and incompletely understood endocrines safe? Œstrin may be carcinogenic. In therapeutic doses, however, its carcinogenic properties appear to be almost insignificant and its effect, if any, would probably be similar to other extrinsic causes of cancer such as the aniline dyes and gastric irritants. It would probably determine the site, and might even antedate the appearance, of cancer in susceptible persons rather than generate cancer in a patient who would not otherwise suffer from it. In addition its effects on the menstrual cycle and its almost totally unknown psychological effect make it a dangerous weapon in the hands of the unwary. Such objections apply with even more force to testosterone, with its well-known powers of masculinisation. All our patients receiving this substance are subjected to frequent and regular examinations for the detection of the earliest evidence of this undesirable effect. Endocrine therapy has come to stay. Its value in reproductive and menopausal disorder is, I am told, being increasingly demonstrated. But before resorting to it we must be quite sure that it is doing what we intend it to do, and, perhaps more important, that it is not doing what we do not intend it to do. At present there is no justification other than the experimental for administering endocrine preparations to patients with chronic mastitis.

If we relieve the symptoms we have done all that is required for the welfare of these patients. Fortunately, in a very large proportion of cases this can be done. First, it is necessary to make quite sure of the diagnosis. If there is the slightest doubt as to the malignancy of a lump in the breast, then that breast should be operated upon by one of the recognised procedures adopted in cases of doubtful lumps in the breast. If, after a careful examination, there is no doubt but that the case is one of chronic mastitis, the patient should be reassured. She should be told in so many words that she is not suffering from cancer and that her condition does not predispose to cancer; that she has no more liability to cancer than any other woman of her acquaintance. She should be supplied with a well-fitting breast support and a "placebo" may be prescribed. If the pain varies with the weather, diathermy may be found helpful. If it comes on just before the menstrual period, she should be advised to rest and to avoid using the arms as far as is practicable at this time.

Most patients suffering from chronic mastitis will benefit enormously from such treatment, but there remains a percentage in whom the pain persists and renders life intolerable. I have not had any personal experience of X ray therapy with this disease, but patients attending the mastitis clinic who have had a course of treatment with X ray therapy and whose symptoms have been made worse, have persisted or, after a temporary easement, have returned, make me suspicious of its effect.

Finally, for the patient who despite palliative measures still complains of bad pain in the breast,

I have given submammary injections of proctocaine. This treatment is simple to carry out, is safe, and from the ease with which the proctocaine is projected from the needle the impression is gathered that the oil spreads out in the submammary plane. The effect is to abolish temporarily all sensation from the breast, and the pain is completely relieved, but for some reason this effect is not so prolonged as when the same substance is employed in the region of the anus, and the pain returns in about a week. Recently I have been giving alcohol injections into the 3rd, 4th, and 5th intercostal nerves in the axillary line. The results of such forms of local treatment encourage me to think that some method may be found suitable for abolishing the pain in obstinate cases of mastitis, especially when this pain comes on at intervals and lasts for a short time only.

SUMMARY

1. Chronic mastitis is defined as any painful or nodular lesion of the breast not due to bacterial inflammation, new growth, or fat necrosis.

2. There are three factors producing the pain—an endocrine factor, a neuralgic factor, and a psychological factor.

3. The cause of nodularity is probably endocrine.

4. The views of the histologist and the experimental pathologist are discussed.

5. Although highly suggestive evidence of the precancerous nature of mastitis has been advanced by the histologist and the experimental pathologist, the chance of cancer following chronic mastitis is so small that it may be disregarded in the treatment of this condition.

6. In spite of the most extravagant claims to the contrary, the use of endocrine preparations in the treatment of chronic mastitis is permissible only on experimental grounds. Even if the main effect of these products is what we desire, the subsidiary effects are so ill understood and in many cases so undesirable, that many years of careful work may be necessary before it is safe to advise their therapeutic application in general practice.

I should like to thank Dr. R. T. Grant, director of the clinical research unit at Guy's Hospital, and also my father for their helpful criticisms of this paper. The photomicrographs are the work of Mr. G. Walker, of the anatomical department of Guy's Hospital, whose interest and assistance are unfailing. The clinical investigations were made possible by the coöperation of the members of the staff of Guy's Hospital, who have supplied me with a steady stream of material, and by the aid of a grant from the British Empire Cancer Campaign.

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INTRATHECAL SULPHANILAMIDE IN MENINGOCOCCAL MENINGITIS

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ONLY a few papers have been published that deal with the passage of sulphanilamide into the cerebro-spinal fluid (C.S.F.), its time of appearance, concentration, and influence upon meningococcal infection.

Buttle, Gray, and Stephenson (1936) and Proom (1937), in their series of experiments on mice, show that the administration of sulphanilamide by mouth or intramuscularly prevents death after otherwise lethal doses of meningococci.

The protection however is limited. If the number of meningococci injected exceeds a certain limit, the mice will die in spite of the sulphanilamide even if it is given in the most favourable doses. And, furthermore, the experiments show that treatment has to be instituted soon after infection. A delay even of a few hours will diminish the protective influence considerably.

Marshall, Emerson, and Cutting (1937), in their work on the elimination of the sulphanilamide into the C.S.F. of both dogs and humans, have demonstrated sulphanilamide in the C.S.F. four hours after giving it by mouth, in concentrations that varied from a third to three-quarters that in the blood (the concentration in the blood was 4·0–6·5 mg. per 100 c.cm.). In other words they have shown that elimination takes place rapidly and in a comparatively high concentration. But it must be noted that these experiments were made on healthy animals and humans. If the meninges are infected, the elimination presents a different picture. Jauerneck and Gueffroy (1937) have found that in patients with meningitis one or two days may elapse before the sulphanilamide can be demonstrated and that the concentration in many cases is very small (0·01 mg. per 100 c.cm.). They mention that they have treated 7 cases of purulent meningitis with sulphonamide preparations, by mouth and intramuscularly. Of these 5 died, the 2 survivors being only mild cases. The remedy then does not appear to be particularly effective when administered in this fashion.

The Americans, Schwentker, Gelman, and Long (1937), have published 12 cases of meningococcal meningitis treated with intrathecal and intramuscular injections of sulphanilamide solution. There were 5 children aged 2–10 and 5 adults aged 21–34, and the disease varied from moderate to very severe. Only one died—a man 27 years old, who developed pneumonia.

PREPARATION AND METHOD

In the Blegdamshospital we have used the treatment with sulphanilamide in 12 consecutive cases of meningococcal meningitis. We worked with a preparation called Streptamide (Løvens, Copenhagen), supplies of which were given us so that we might test its value.

Streptamide, like all other preparations of sulphanilamide, is difficult to dissolve, reaching saturation at 0·9 per cent. We have used a 0·8 per cent. solution made from small bottles containing 20 g. each, previously sealed and sterilised in an autoclave. Our procedure in making the solution has been as follows: A suitable amount of streptamide—0·8 or 1·6 g.—is weighed, with aseptic precautions. A sterilised Erlenmeier flask containing 100 or 200 c.cm. of 0·9 per cent. saline is heated until the

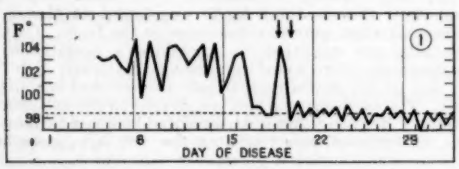
solution begins to boil, the heat is then turned off and the streptamide is put into the flask which is agitated until the crystals are dissolved. The flask is then cooled off until the temperature is about 100° F., at which temperature the injection is made.

Into the spinal canal we have always injected a little less fluid than the amount withdrawn, never more than 30 c.cm. Intramuscularly we have injected as much as 70–150 c.cm. streptamide solution according to the weight of the patient. In addition to the injections with streptamide we have treated the patients with withdrawals of C.S.F. For the first 10–20 days this has been done daily, later every second or third day.

CLINICAL RESULTS

(See Chart to each case)

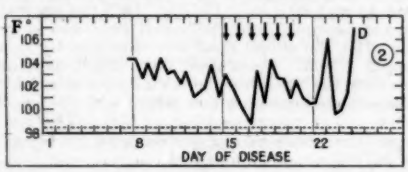
CASE 1.—A boy, aged 2, was admitted on May 23rd on the 5th day of his illness. His fever was high, general condition very bad. There was ptosis of the left eyelid, strabismus, much rigidity of neck and back. C.S.F.: 1331/3 cells * and many intra- and extra-cellular meningococci. On the day after admission (6th day) treatment with meningococcus vaccine was instituted but without



The arrows indicate dose of sulphanilamide.

any change in his condition. On the 15th day (9 days later) we began the streptamide treatment. On 3 different days (June 3rd, 5th, 7th) he was given respectively 20, 30, and 15 c.cm. intrathecally and about 100 c.cm. daily intramuscularly. He improved very quickly. From June 8th his temperature was normal, and he was discharged on July 12th perfectly well.

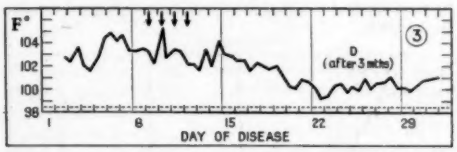
CASE 2.—A boy, aged 6 months, was admitted on July 7th having been ill for 6 days with high temperature (up to 104° F.) and neck rigidity. He had also a bilateral suppurative otitis media for which we did a paracentesis. General condition fairly good. C.S.F.: 1000/3 cells, but no demonstrable meningococci until July 14th. On the



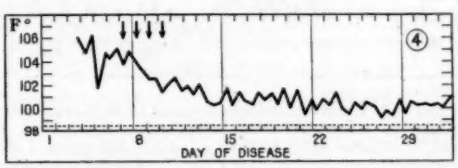
D = Death.

day after this (the 15th day of his illness) treatment with streptamide was begun. He was given six intrathecal injections over 6 days, 20 c.cm. daily and also 80–100 c.cm. daily intramuscularly. There was some improvement during the first two days after the beginning of the treatment, but later on he became worse and on July 25th pneumonia was diagnosed. The boy died.

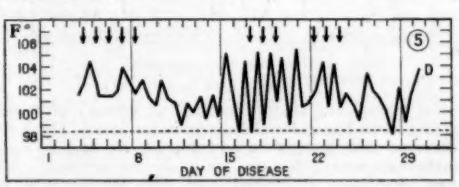
CASE 3.—A girl, aged 4 months, was admitted on July 9th on the 2nd day of her illness with fever of 102°–104° F. and gastro-intestinal symptoms: vomiting and thin foul-smelling stools. On the 7th day meningeal symptoms became evident. C.S.F.: 10,000/3 cells and many meningococci. On the 10th day she was given 8 c.cm. streptamide intrathecally and the next day 10 c.cm. For these and the next 2 days she received daily 80 c.cm. intramuscularly. Six days later her temperature was normal. She was discharged with a hydrocephalus but was soon readmitted, because the mother could not give her proper care. The hydrocephalus increased and finally caused her death on Oct. 5th.



CASE 4.—A girl, 4 years old, was admitted on July 13th after 2 days' illness with a temperature of 106° F. There was angina with plaques, abdominal pain, and vomiting, but no meningeal manifestations. C.S.F. contained no cells and no bacilli. On July 15th rigidity of back and neck set in and Kernig's symptom was positive. There were about 7000/3 cells in the C.S.F. and many meningococci. Next day (5th day of illness) we began treatment with streptamide and for 4 consecutive days she had 20, 20, 30, and 10 c.cm. intrathecally and about 150 c.cm. daily intramuscularly. Her general condition improved very rapidly and the temperature fell. On July 25th she began to have symptoms of polyarthritis. There was swelling, redness, pain, and limitation of motion in several joints, but after about a month (August 20th) these symptoms had disappeared and the temperature was normal and remained so. She was discharged on Sept. 9th healthy in every respect.



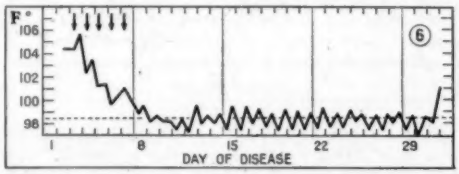
CASE 5.—A boy, aged 1½, was taken ill on July 26th and admitted on the 3rd day with symptoms pointing to meningitis. C.S.F.: 15,000/3 cells and many meningococci. On the day after (4th day) and for 5 consecutive days streptamide was administered, 10–20 c.cm. intrathecally and 100–150 c.cm. intramuscularly. General condition improved and the temperature fell, but on August 9th it rose again to 104·7° F. While injections were being given there were no demonstrable meningococci in the C.S.F., but on this day they reappeared. On August 11th, 12th, and 13th, and also on 16th, 17th, and 18th, he was again given streptamide injections. He continued sick and miserable. On the 24th he became weak, listless, and tired, and died.



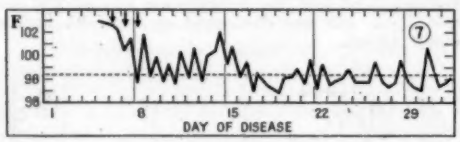
CASE 6.—A 1-year-old girl became ill on August 21st with a temperature of about 104° F. On admission next day her condition was very poor. We found signs of rickets—the rosary, Harrison's sulcus, and hypertrophy of the epiphyses. There was rigidity of back and neck, numerous petechiæ and ecchymoses on buttocks and thighs about the size of a shilling. C.S.F.: about 20,000/3 cells and abundant meningococci. Diagnosis: meningococcal septicæmia and meningitis. Streptamide injections were instituted on the 3rd day. Three days in succession she received 10 c.cm., and then for 2 days 5 c.cm., intrathecally; during both periods she daily had

* 1331 cells in 3 c.mm. of C.S.F.

100 c.cm. intramuscularly. During this period of daily injections the temperature fell and became normal on August 29th (9th day) and from then on remained so. The improvement in her general condition was quite dramatic. One evening she was apparently dying and had a temperature of 105·8° F. The next evening she was sitting up in bed—eating. She was discharged as cured on Sept. 30th.

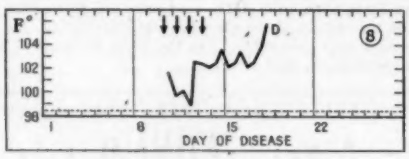


CASE 7.—A boy, aged 7 months, became ill on Sept. 6th with fever, vomiting, and thin, watery stools. On the 5th day he was admitted to a pediatric hospital, having convulsions that lasted five minutes. C.S.F.: 2700/3 cells and numerous meningococci. Next day he was transferred to this hospital and was on admission a very sick child. He cried at the slightest touch, had pronounced rigidity of back and neck, and all over his back and his limbs petechiæ were found and ecchymoses almost the size of a lentil. Treatment with streptamide was begun on Sept. 12th, the 7th day of his illness. For 3 days he



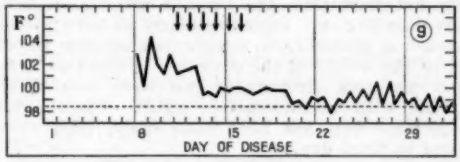
received 10 c.cm. intrathecally and 100 c.cm. intramuscularly, whereafter the streptamide was given by mouth, 2 tablets daily of 0·30 g. each. His general condition began to improve after a few days and the temperature was normal from Sept. 23rd (17th day). The first three weeks he had lumbar puncture every day, during the next 14 days every third day. He was discharged on Nov. 21st perfectly normal in mind and body.

CASE 8.—A boy, aged 7 months, developed on Oct. 22nd a temperature of 104° F. Nine days later he had convulsions and for that reason he was admitted to a children's hospital. Here he did very badly; his hæmoglobin was only 45 per cent. and the C.S.F. contained 9000/3 cells and an abundance of meningococci. Consequently he was



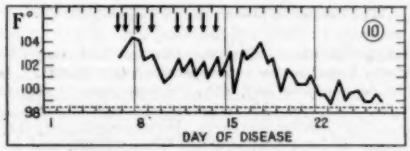
at once transferred to this institution, where streptamide treatment was begun immediately on his arrival (10th day of illness). For 4 days he had 20, 12, 20, and 20 c.cm. intrathecally and 100 c.cm. daily intramuscularly. His general condition improved and the temperature fell during the first 2 days, while he was receiving injections. Then the temperature began to rise again and he became more ill and listless, the amount of cells in the spinal fluid became greater, even as high as 45,000/3 cells on Nov. 5th. He died on Nov. 8th.

CASE 9.—A boy, aged 4 months, became ill on Dec. 3rd with a temperature of 104·2° F. On Dec. 7th he was sent to a children's hospital. On Dec. 9th 4800/3 cells and meningococci were found in the C.S.F. He was given prontosil 2·5 c.cm. intramuscularly and the next day 5 c.cm. On Dec. 10th, the 8th day of his illness, he was transferred to this institution. C.S.F.: 25,000/3 cells and meningococci. On the next and on the following 5 days he had 15, 8, 15, 18, 10, and 20 c.cm. streptamide intrathecally and 35–50 c.cm. intramuscularly every day. On Dec. 19th (17th day) the temperature became normal, the number of cells decreased rapidly, and 5 days later only 700/3 were found. On the 22nd an abscess was

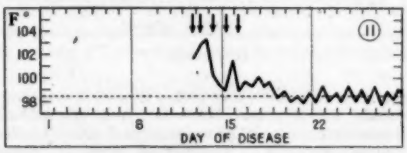


discovered on the right side of the thorax. This was opened the next day. At the same time the stools became thin, greenish, and full of mucus, and the temperature rose a little. This lasted until Dec. 29th, when his stomach again acted properly and his temperature became normal. The patient is still with us because meningococci are still demonstrable in the throat.

CASE 10.—A 3-month-old girl became ill on Jan. 8th; temperature 102° F.; uneasiness; loss of appetite; thin, slimy, foul-smelling excrements. On Jan. 10th an ecchymosis the size of a lentil was found at the right elbow and a few petechiæ elsewhere on the body. On the 11th she was admitted to a children's hospital with the diagnosis enteritis and hæmorrhagic diathesis. On the 6th day of her illness lumbar puncture showed meningococci. The same day she was transferred to the Blegdamshospital. Her condition when admitted here was extremely poor, ecchymoses were found on the left arm, petechiæ



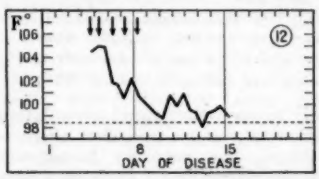
on the left calf, on the buttocks, and on the face. The C.S.F. was for the first few days purulent and so heavy that it could not of itself escape through a fairly wide lumbar cannula, but had to be drawn out. We at once began treatment with streptamide, giving one injection daily for 8 days; the amount of liquid injected intrathecally varied between 10 and 15 c.cm., intramuscularly between 40 and 80 c.cm. On Jan. 18th the general condition was improved and the spinal fluid was now thin. On Jan. 21st the spinal fluid was only slightly opaque; cell count 1150/3. From Jan. 29th (22nd day) on the temperature has been in the vicinity of normal. She was discharged as cured on Feb. 27th.



CASE 11.—A boy, aged 8 months, on Jan. 6th began to take sick, having a little fever and cough. On Jan. 14th the temperature was 103° F., so he was admitted to the children's hospital, the case diagnosed as bronchitis. He vomited frequently and cried at the slightest touch. On Jan. 17th he showed rigidity of the neck, and meningococci were found in the C.S.F. The same day (12th of the disease) he was transferred to the Blegdamshospital. C.S.F.: 5800/3 cells and numerous meningococci. We began at once treating him with streptamide; 15–20 c.cm. was given for 5 days intrathecally and 100 c.cm. a day intramuscularly. His general condition improved rapidly.

Since Jan. 21st the temperature has been normal. He was discharged cured on March 3rd.

CASE 12.—A 1-year-old girl, after a period of colds, suddenly on Jan. 20th became feverish (103·4° F.), and was admitted to a children's hospital. Diagnosis: catarrh, ? otitis media. Some swelling was found over the left mastoid, so she was transferred to an otological department. Nothing abnormal was found in her ears, however, nor any typical meningeal symptoms, but the anterior fontanelle was somewhat tense. Lumbar puncture showed 8000/3 cells and numerous meningococci. She was transferred to the Blegdams hospital on the 4th day when we found 17,000/3 cells in the spinal fluid and numerous meningococci. We gave streptamide injections for 5 days, 10 c.cm. intrathecally and 40 c.cm. intramuscularly each day. The temperature fell during the period of injections and has been about normal since the 9th day. She was discharged as cured on March 4th.



COMMENTS

Of our patients, 7 were boys and 5 were girls. Their ages were 3, 4, 4, 6, 7, 7, 8 months, 1, 1, 1½, 2, and 4 years. They were all severe cases. Out of these 12 patients 3 died, their deaths resulting directly or indirectly from their meningitis (Cases 2, 5, and 8). Case 2 had on admission besides meningitis bilateral, acute, suppurative otitis media, and developed pneumonia shortly before he died. Case 5 presented an unusual picture. After the first series of streptamide injections his general condition improved, temperature fell, and the meningococci could not be demonstrated in the C.S.F. On the fourteenth day of the illness the general condition became less satisfactory, the temperature rose, and the meningococci again appeared. Repeated treatment with streptamide proved without effect. Case 8 was, before he developed meningitis, in a very poor condition generally, his hæmoglobin being only 45 per cent. Case 3 died from hydrocephalus three months after the acute meningitis had subsided.

Two patients (Cases 6 and 7) among those that got well are outstanding, because both had meningococcal septicæmia which has a prognosis that is notoriously bad. Both of those children, one aged a year, the other 7 months, were at the time of their admission so run-down that we regarded the outlook as hopeless. Nevertheless they got well and they got well quickly.

Here in this hospital the mortality for meningococcal meningitis in children under 4 has in the last six years (in 68 cases) varied from 50 to 100 per cent., and has on an average been 70 per cent. Of those of our patients, that were treated with streptamide, only 25 per cent. died. The number treated is not very large, but the figures seem to indicate that the mode of treatment used is able to reduce the mortality considerably.

In the cases that are published by the Americans conditions are more favourable from the beginning, because the mortality of meningitis is very much less in older children and in adults—even without sulphanilamide—than in babies.

The conclusion so far reached about the sulphanilamide treatment of meningococcal meningitis here and elsewhere is that it has but little effect if the remedy is administered exclusively by mouth or intramuscularly. But if it is given intrathecally along with the other administrations, then the treatment is very valuable. This is probably because the elimination of the sulphanilamide through the meninges may be both very slow and very slight when they are inflamed. It is not likely that intrathecal injections alone are sufficient, because meningococci can be found outside the spinal canal, and on these the sulphanilamide, when given by mouth or intramuscularly, can have considerable effect.

SUMMARY

Twelve cases of meningococcal meningitis in children under 4 have been treated with intrathecal and intramuscular injections of 0·8 per cent. sulphanilamide solution. The amount injected into the spinal canal is from 5 to 30 c.cm., according to the amount of spinal fluid withdrawn. The amount injected has been less than the amount withdrawn. The intramuscular doses have been from 35 to 150, according to the weight of the patients. In the series 3 have died (25 per cent.). The average fatality-rate in this hospital for the last six years has been 70 per cent. for children under 4.

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PSEUDO-HÆMOPHILIA IN A WOMAN

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THE possibility of hæmophilia occurring in the female is a problem that has resulted in much speculation but no definite solution. Many reported cases have been claimed as examples of this condition, but in none is the evidence conclusive, and in most the diagnosis is completely unwarranted. Hæmophilia is a well-defined condition, and certain clinical and laboratory findings, quite apart from questions of sex or genetics, constitute the criteria upon which its diagnosis should depend. In the present state of our knowledge these may be summarised as follows:

(1) The tendency, from early infancy, to excessive bleeding following trivial injury.
(2) After the first few years of life, hæmorrhage into the joints.
(3) A definite delay in the coagulation of the blood, but no quantitative alteration in the platelet, prothrombin, fibrinogen, or calcium content.
(4) The absence of any cause for the hæmorrhagic tendency other than the defective blood coagulation.

Unless these conditions can be fulfilled a diagnosis of hæmophilia cannot be made with confidence, though occasionally a mild case may escape hæmarthrosis. The case that follows is reported because of its remarkably close adherence to these conditions.

CASE REPORT

The patient is a woman, now aged 60, employed in a potato-chip factory.

History.—She was quite well until June, 1933, when the extraction of a tooth resulted in hæmorrhage that persisted for a week. A month later the left elbow became swollen and stiff, and when the

* Assisted by a grant from the Medical Research Council.

swelling subsided a week afterwards there was some limitation of movement. In January, 1934, she bled from the rectum for 3 days, and a year later had an attack of hæmaturia lasting about 3 weeks, during which she was admitted to the Central Middlesex County Hospital. A complete investigation of the urinary tract failed to reveal a cause for the bleeding. In May, 1936, she reappeared at the hospital with a swelling of the tongue, which had begun without obvious cause a few hours previously. On examination the tongue, which was greatly enlarged, was found to be dark in colour, apparently infiltrated with blood, and exuding a blood-stained fluid. There was slight swelling in the submental region. No local cause could be found for the hæmorrhage, and no other physical abnormality was detected, apart from the limited movements at the left elbow. The blood count was normal, and the platelets numbered 194,000 per c.mm.; blood pressure 140/80 mm. Hg. The next day the tongue was almost black, and a bluish discoloration had appeared on the neck, later spreading down to both clavicles and over the sternum. The tongue returned to its normal size in about 10 days, the discoloration disappearing more gradually.

In the ensuing 12 months the patient was readmitted to hospital on four occasions with severe hæmorrhages into various parts of the body. One involved the left forearm from elbow to wrist, another the whole of the right arm from shoulder to hand. There were others into the conjunctivæ, and the subcutaneous tissues of the face, neck, thighs, and buttocks. The right elbow also became swollen, and later permanently limited in its movements. During these visits no abnormality was found on examination that was not directly the result of hæmorrhage, apart, possibly, from the joint changes. Both elbows showed extension limited to about 135°.

Investigations.—The following investigations were carried out: Radiograms: chest and heart normal; elbow-joints, some arthritis. Wassermann reaction negative. Urine: a few red cells and a trace of protein on one occasion, otherwise normal. Ascorbic acid: 104·6 mg. excreted in 24 hours.

Blood.—Calcium, 11 mg. per 100 c.cm. Fibrinogen, 320 mg. per 100 c.cm. Blood count:

Red cells	4,300,000 (per c.mm.)	White cells	9000 (per c.mm.)
Hæmoglobin	82 %	Polymorphs	61 % (5490)
Colour-index	0·95	Lymphocytes	35 % (3150)
		Monocytes	3 % (270)
		Eosinophils	1 % (90)

Some polychromasia. Mean corpuscular volume 88 cu.μ. Reticulocyte count, 3·4 %. Red-cell fragility normal. Platelet counts, 200,000–280,000 per c.mm. (highest and lowest of four counts).

Tourniquet test: slight positive on one occasion, negative on others. Bleeding time never more than 4 min. (Duke's method). Coagulation time: (1) 3 min. 5 sec.–6 min. (upper and lower limits of four estimations by Dale and Laidlaw's method; normal upper limit 2 min.). (2) 43–67 min. (upper and lower limits of five estimations by Lee and White's method; normal upper limit 12 min.). Clot retraction: 46 per cent. as measured by a method to be published shortly by one of us (R. G. M.); this value, rather lower than normal, lies within the figures obtained in hæmophilia; the clot after retracting was strikingly like a hæmophilic clot, being shaggy and irregular, in contrast to the smooth, rounded surface normally seen.

INVESTIGATION OF DEFECT IN COAGULATION

The only detectable abnormality, apart from the positive tourniquet test on one occasion, was the defect in the coagulation of the blood. Two experiments were made to investigate this defect further.

Russell's viper venom behaves like thrombokinase, that is, it apparently activates prothrombin in the presence of calcium.

One part of a 1 in 10,000 solution of the venom was added to 9 parts of the patient's blood, and also to normal and to hæmophilic blood in the same proportion. This experiment was carried out in Wassermann tubes at 37° C. and coagulation was timed to the moment at which the tubes could be inverted without spilling the contents.

TABLE I—EFFECT OF RUSSELL'S VIPER VENOM

	Coagulation times.	
	Plus saline.	Plus venom solution.
Patient's blood	48 min.	31 sec.
Normal blood	9 „	17 „
Hæmophilic blood	45 „	23 „

From Table I it will be seen that rapid coagulation occurs on the addition of venom, and that there is little difference between the patient's blood and hæmophilic blood in their reactions. In both a firm clot was formed. Hence fibrinogen, calcium, and prothrombin are present in the patient's blood, and functionally active on the addition of kinase.

Coagulating factor.—Recent work by Patek and Taylor (1937) in the United States and by Bendien and Creveld (1936) in Holland shows that normal plasma contains a factor capable of accelerating the coagulation of hæmophilic blood. This factor, which may be identical with prothrombin, is still active in plasma that has passed through a Berkefeld or similar filter, in spite of the fact that such plasma itself clots slowly on recalcification. Hæmophilic plasma is inactive in this respect. It was clearly of interest to see how the patient's blood behaved with regard to this factor.

For this experiment blood was obtained from the patient, a hæmophilic subject, and a normal donor, and each sample was citrated with 0·1 volume of 3·8 per cent. sodium citrate solution. The plasma was obtained by centrifuging, and then filtered through a Seitz filter, a new pad being used for each sample of plasma. Blood was obtained from a second hæmophilic donor, and equal volumes were measured into Wassermann tubes. The filtered plasma was added to this whole blood, in the proportions of 1 volume of plasma to 9 volumes of blood. The temperature was kept at 37° C., and coagulation timed as before. The results given in Table II show that the patient's plasma, unlike normal plasma, fails to accelerate the clotting of hæmophilic blood.

TABLE II—EFFECT OF FILTERED PLASMA ON HÆMOPHILIC BLOOD

Hæmophilic blood plus—	Coagulation time.
Saline	31 min.
Normal plasma	6 min. 50 sec.
Hæmophilic plasma	30 min.
Patient's plasma	28 min. 30 sec.

The next experiment had to be carried out with the patient's citrated plasma (unfiltered), since no whole blood was available. It was recalcified with 0·2 volume of 1·18 per cent. calcium chloride solution, and filtered normal and hæmophilic plasma added immediately afterwards, in the same proportions as before. The results are given in Table III.

TABLE III—THE EFFECT OF FILTERED PLASMA ON THE UNFILTERED PLASMA

Patient's plasma plus—	Coagulation time.
Saline	32 min.
Normal plasma	6 min. 40 sec.
Hæmophilic plasma	24 min. 5 sec.

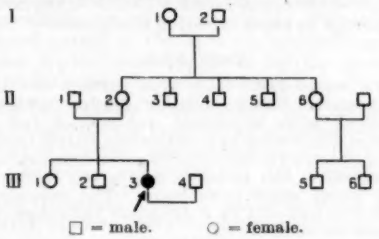
Again there is a similarity to hæmophilic blood, since the coagulation of the patient's plasma is accelerated by normal filtered plasma, and but little affected by hæmophilic plasma. All these experiments suggest, therefore, a similarity between the

patient's blood and hæmophilic blood, since in both there is inactivity of a factor which is active in normal filtered plasma.

PREVIOUS FAMILY HISTORY

There was nothing to be discovered in the patient's previous history to account for the onset of the hæmorrhagic diathesis. She had always been well, with no suggestion of a dietary deficiency. Menstruation was regular and never excessive. She had a miscarriage at the age of 28 but no other pregnancies. The menopause occurred at the age of 53. Several teeth were extracted soon afterwards, without excessive bleeding.

All her relatives have died or been lost sight of, so that no direct investigations are possible. So far as can be obtained from her, her pedigree and the family history are as follows:—



I/1 no information; I/2 died aged 65, no previous ill health.

II/1 died aged 74, no previous ill health; II/2 died aged 76, farm worker, always healthy; II/3, 4, and 5 all died of old age after healthy lives; II/6 died of old age.

III/1 died in infancy, cause doubtful; III/2 killed in Boer War, previously healthy; III/3 the patient; III/4 died of cancer in 1915; III/5 and 6 believed to be alive, healthy when last heard of.

COMMENTS

The main features of this case, therefore, are as follows:—

(1) The sudden onset, in a woman of 56, of a tendency to bleed, resulting in hæmorrhage from a tooth socket, hæmaturia, rectal hæmorrhage, and many extensive hæmorrhages into the tissues and, possibly, into the joints.

(2) No organic cause for this tendency was found, other than a prolonged coagulation time and, on one occasion, a faintly positive tourniquet test. The platelets, bleeding time, blood calcium, and blood fibrinogen were normal.

(3) The patient's blood and hæmophilic blood behave similarly in their reactions to kinase and filtered plasma.

(4) There is no history of similar condition occurring in any other member of her family.

There is, therefore, a remarkable resemblance between the findings in this case and in hæmophilia, but there are points of divergence. First, the condition is acquired. No genuine instance of hæmophilia acquired in late adult life has, so far as we know, been recorded. Secondly, the fact of hæmorrhage into the joints has not been established, though the history and subsequent limitation of movement is suggestive. The points against it are that the elbow is seldom the first joint to be involved in hæmophilia, and that limitation of movement usually occurs only after several hæmorrhages. Thirdly, the tourniquet test produced a small crop of minute petechiæ on one occasion, evidence of capillary involvement which does not occur in hæmophilia. It is because of these points of divergence that we have labelled the case pseudo-hæmophilia, but it resembles hæmophilia more closely than any other hæmorrhagic condition.

In the cases previously recorded, the resemblance to hæmophilia is usually superficial or non-existent.

Bullock and Fildes (1911), in their monumental survey of all hæmophilia records up to 1911, found no conclusive evidence that the condition occurred in females. They examined the records of over 600 hæmophilic families.

Carrol Birch (1937), from personal observation of 78 hæmophilic families in the United States, finds that none of them includes affected females, and in this country, one of us (R. G. M.) has had a similar experience with 41 families. Handley and Nussbrecher (1935) record the nearest approximation to inherited hæmophilia in the female. They describe two sisters with hæmorrhagic symptoms and slightly delayed blood coagulation. The bleeding times and platelet counts were normal. The women belong to a large family of bleeders originally examined by Bulloch and Fildes, who dismissed the diagnosis of hæmophilia, the hæmorrhagic tendency being transmitted directly from father to son for three generations. The affected females were the offspring of a first-cousin inter-marriage.

Bucura (1920) collected 197 cases of female "hæmophilics" from the literature, but found that to none of them did the diagnosis truly apply.

Mildred Warde (1923) records a case, under the title of "female hæmophilia." The patient had bled badly from a tooth socket and a cut thumb, but the fact that removal of a breast caused no undue hæmorrhage must throw some doubt on the severity of the hæmorrhagic tendency. The coagulation time was 3 min. 5 sec., but this is unenlightening as the method used is not specified. No other investigations were made.

Foulis and Crawford (1934) give a brief account of two "female bleeders" said to come of hæmophilic stock, though the inheritance shown in their chart is atypical. Again the evidence is inconclusive, and no investigations were made.

On the Continent Bauer and Meller (1937), Bauer and Wehefritz (1924), Cassoute and Raybaud (1924), Gasbarrini (1933), and Steinbrink (1925) report cases remarkable for their similarity to each other. In these, women and girls show a definite tendency to bleed, and investigations reveal prolonged clotting and bleeding times and thrombocytopenia. In view of these last two observations a diagnosis of hæmophilia cannot be justified, but the constancy of the findings suggests that these cases may be examples of a definite hæmorrhagic syndrome.

Finally Schultz (1930) reports the case of a girl, said to come of hæmophilic stock. She had, among other hæmorrhages, hæmaturia and bleeding into the joints, the latter being a condition that apparently did not occur in the other cases. On reaching the age of puberty her symptoms disappeared. It is unfortunate that no investigations were made, as the clinical picture closely resembles that of hæmophilia. In view of the storm that has lately raged about the question of ovarian function in relation to hæmophilia, it might be unwise to suggest an analogy between the disappearance of symptoms at puberty in Schultz's case and their appearance after the menopause in ours.

CONCLUSION

The case described probably bears little relation to the familiar hereditary hæmophilia in the male, for the reasons discussed. It can, therefore, shed little light on the question of female hæmophilia from the genetic point of view. It does, however, represent a hæmorrhagic diathesis with a pathology almost undistinguishable from that of hæmophilia, whatever ætiological differences there may be in the two conditions.

(*References at foot of next page*)

SEROLOGIC STUDIES IN EPIDEMIC INFLUENZA

WITH PARTICULAR REFERENCE TO THE PERSISTENCE OF ANTIBODIES AFTER INFECTION

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Although recovery from a virus disease is usually accompanied by a high degree of resistance to subsequent infection, immunity to influenza is of relatively short duration; several attacks in the same individual are not uncommon. In view of the high antibody content usually found in those who have recently recovered from infection, this low-grade immunity is surprising. The reason for this paradoxical position has not been determined, but probable factors are: first, the existence of several immunologically distinct strains of virus and, secondly, the rapid disappearance of the antibodies produced by infection. As a number of recently infected persons were available an opportunity was presented of studying over a period of 10–12 months fluctuations in the antibody content of their serum—i.e., the rôle played by the second of the above factors.

Available evidence strongly indicates that there is a relationship between the presence of specific antibodies in the serum and resistance to infection with the influenza virus. Several workers have reported that, after recovery from epidemic influenza, there is generally an appreciable increase in the titre of both the neutralising and complement-fixing antibodies (Francis and others 1937, Hoyle and Fairbrother 1937). Hoyle and Fairbrother also found that, in a selected community, during the 1936–37 epidemic only those with a low antibody titre became infected, while two persons with relatively high titres and coming in close and continued contact with cases of influenza remained apparently unaffected. Only a small number (44) was observed and it must also be stated that several with low titres did not become infected. Smorodintseff and his co-workers (1937) reported that individuals with little or no antibodies were readily infected when sprayed with the virus, while those with relatively high titres were resistant. The antibody titre thus appears to be a simple index of resistance to infection—absence of antibodies or a relatively low titre indicates susceptibility and a high titre resistance. The critical level that demarcates these two states can not however be defined with any accuracy. Hoyle and Fairbrother (1937) suggested that resistance was indicated by a titre of the fixing antibody in the region of 1 in 8, according to their method of carrying out the test.

It has also been found that ferrets recently recovered from infection with the virus are resistant to reinfection and that their serum has a relatively high antibody content. After a varying period of 5–12 months the immunity wanes; antibody concentration is decreased and the intranasal instillation of the virus gives rise to an infection that is milder than in normal animals. This waning immunity can be reinforced by active immunisation. It has been suggested that most subjects resemble the recovered ferrets in that they have some basic immunity (Smith, Andrewes, and Laidlaw 1935). This, however, is not enough to resist infection in all cases.

(*Continued from previous page*)

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TECHNIQUE

Neutralisation test.—This was carried out in the usual manner. Serum suitably diluted with saline was mixed with an equal volume of the virus suspension containing approximately 10,000 minimum infecting doses, after standing at room temperature for 15–30 minutes, the mixture was given intranasally to mice under ether anæsthesia. The animals were killed at the end of 4 or 5 days and the lungs closely examined for lesions.

Complement-fixation test was performed in the manner previously described (Fairbrother and Hoyle 1937). The antigen was a saline suspension of dried mouse lung lesions and 2½ M.H.D. (minimum hæmolytic doses) of complement were used. The titre is taken as the initial dilution of the serum added to the complement-fixing system. Francis and his colleagues (1937) have adopted the final dilution to express the titre; this would, of course be a three-fold greater dilution than that in our test. We have, however, continued to employ the conventional method of expressing the titre of serum in this reaction, and the necessary allowance must therefore be made in comparing the two sets of results.

TABLE I—COMPLEMENT-FIXATION TESTS OF SERA BEFORE AND AFTER 1936–37 EPIDEMIC

Titre.	Groups—A	B	C
	Post-epidemic (October, 1937).	Pre-epidemic (1936).	Convalescent.
1:128	0	0	9
1:64	0	0	13
1:32	7	0	14
1:16	12	2	10
1:8	72	15	11
1:4	79	60	8
1:2	65	63	0
Doubtful 1:2 ..	54	64	0
Negative ..	92	96	0
Total ..	381	300	65

RESULTS

Group A.—The complement-fixation test was carried out on samples of serum collected at random during the past few months from specimens sent in for the routine Wassermann test. The results are given in Table I, together with those previously obtained (Group B) during 1936 (pre-epidemic period)

from a similar group of sera, and (Group C) from a group of convalescents after the epidemic in January, 1937 (Hoyle and Fairbrother 1937). The results given by the sera recently collected were similar to those obtained during the pre-epidemic period in that there was an absence of high titres. None of the pre-epidemic sera had a titre as high as 1 : 32 and only 2 per cent. of the recently tested sera gave this reading. Comparing the two series within the range of 1 : 16 to 1 : 8 it is seen however that the titres of the recently collected group were somewhat higher. These are nevertheless in sharp contrast with the convalescent sera, 55 per cent. of which gave a titre of 1 : 32 or over. The absence of high titres in the recently examined Group A is of particular interest and appears to be due either to the absence, in the group, of persons infected during the epidemic or to the fact that the high titres resulting from an attack of the disease are not maintained for any length of time. The latter possibility seems more probable in view of the widespread nature of the 1936–37 epidemic and the somewhat higher readings given by the group as compared with the pre-epidemic group.

GROUP B.—Further examinations were carried out on sera obtained from those who had definite attacks of influenza during the epidemic of 1937. The clinical diagnosis was confirmed in each instance by either direct isolation of the virus or serological tests. In a few cases samples of serum had been collected before the attack and also during late convalescence. Complement-fixation tests were carried out in all cases and neutralisation tests in a few. The results are given in Table II. The high titres given by many of the convalescent sera were not obtained with the samples collected some 10–12 months later. In each case there was a decline in the antibody content, and this in many was considerable. The fall was greatest where the convalescent samples had given relatively high values. The investigation was mainly concerned with the complement-fixing antibodies, but the results obtained in the few cases where neutralisation tests were carried out indicate that the neutralising antibodies showed a comparable fall. The results however were not always quantitatively parallel. There was no appreciable alteration in the titres of the convalescent samples—which had been ampouled and kept at 0° C.—except that, where a preservative had been added they tended to be anticomplementary.

TABLE II—FLUCTUATIONS IN ANTIBODY-TITRE FOR NINE PATIENTS RECOVERED FROM EPIDEMIC INFLUENZA

Case No.	Complement-fixation test.			Neutralisation test.		
	Jan., 1937: Before infection.	Feb., 1937: Convalescent.	Jan., 1938.	Jan., 1937: Before infection.	Feb., 1937: Convalescent.	Jan., 1938.
1	0	64	2	0	16	1
2	–	32	16	–	–	1
3	–	64	16	–	–	2
4	+–	32	4	0	16	2
5	–	32	2	–	–	2
6	+–	8	4	–	–	2
7	+–	4	2	1	4	1
8	–	8	4	–	–	–
9	–	32	8	–	–	–

Figures = titre (original serum-dilution).
+– = doubtful in lowest dilution.
0 = negative. – = not done.

GROUP C.—In this group have been arranged the subjects who escaped infection during the 1937 epidemic. The examinations were carried out at intervals of 10–12 months (Table III). Little difference was found in the titres given by the sera of this group after an interval of 11 months. In two instances (Cases 1 and 6) it is interesting to note that complement-fixing, but not neutralising, antibodies were found in the second test, as fixing antibodies usually disappear more quickly than neutralising antibodies; the titres were, however, low in all cases.

TABLE III—FLUCTUATIONS IN THE ANTIBODY TITRE OF ELEVEN NORMAL SUBJECTS

Case No.	Complement-fixation test. 1937.		Neutralisation test. 1937.		No.	Complement-fixation test. 1937.		Neutralisation test. 1937.	
	Jan.	Dec.	Jan.	Dec.		Jan.	Dec.	Jan.	Dec.
1	16	8	–	0	7	2	+–	–	–
2	0	0	0	0	8	0	0	–	–
3	0	0	2	0	9	2	+–	–	2
4	0	0	2	2	10	+–	+–	–	0
5	2	2	–	1	11	2	2	–	0
6	8	4	–	0					

DISCUSSION

The results recorded above support the view expressed by Francis and his colleagues (1937) that the antibody content of convalescent serum is not maintained for any length of time. They found in their series that at the end of 3–5 months there was an average decline of 50 per cent. in both the fixing and the neutralising antibody; the fall was greatest when the convalescent serum had given a high titre. Our findings have been similar; at the end of twelve months the antibody fall has progressed even further.

These results offer an explanation for the relatively short duration of immunity in influenza. There is an appreciable increase in antibodies following infection, but these tend to disappear rapidly and in many cases the titre at the end of twelve months once more is in the susceptible zone. The resistance of such individuals undoubtedly falls in a comparable manner. While they possess some basal immunity that might offer a limited amount of protection against the homologous strain of the influenza virus, it would probably be of little value in resisting infection with heterologous strains, should such strains exist under natural conditions. It has been suggested that there are several distinct strains of the human influenza virus and that while these show definite antigenic overlap, there are distinct immunological differences (Andrewes 1937). Infection with one particular strain would not therefore give rise to a high degree of immunity against the others. Conclusive evidence of this has not yet been obtained. It is, consequently, not possible at present to give any final opinion on immunity to influenza, but it does appear to bear a definite relationship to the antibody concentration of the serum. An important factor in the short duration of the immunity following infection is the failure to maintain the increased antibody concentration.

In the apparently normal group the antibody titres were low and showed little fluctuation. This

is not surprising, as while the fixing and neutralising antibodies are distinct, they are specific and are only produced either by infection with, or inoculation of, the virus.

SUMMARY

After an attack of influenza there is a considerable increase in the antibody content of the serum; this high level is not maintained and after 10–12 months the titres tend to fall to a level similar to that given before infection.

There appears to be a definite relationship between immunity to influenza and the presence of antibodies in the serum.

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VITAMIN K IN HUMAN PATHOLOGY

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VITAMIN K is known as a fat-soluble food constituent that protects certain birds from a characteristic hæmorrhagic disease. This disease and the factor that prevents it were seen and studied by one of us (Dam and others 1929, 1930, 1935–38), the investigation being continued in collaboration with Schønheyder, Lewis, Tage-Hansen, and Glavind. Independently but later, the work also was taken up by Holst and Halbrook (1933) and Almquist and Stokstad (1935, 1936).

ACTION AND SOURCE

The disease is characterised by a great tendency to hæmorrhages and a diminished clotting power of the blood, due to reduced prothrombin. The possibility of a simultaneous decrease in capillary resistance has been attended to but not definitely settled. When chicks are given a diet free from vitamin K, they usually show the disease after 14–24 days. Addition of lemon juice does not prevent the disease when vitamin K is lacking. Rats, guinea-pigs, and young dogs may live and thrive for a long period without vitamin K, but recently the disease has been produced in rabbits and cured by the vitamin (Dam and Glavind unpublished).

Food constituents rich in vitamin K are green leaves, while cereals and carrots are poor sources, and potatoes, mangolds, lemon juice, and cod-liver oil are practically devoid of the vitamin. Yeast and wheat-germ oil are also poor sources. The vitamin may be prepared in the form of very strong concentrates.

Animals that can apparently dispense with vitamin K probably get it from bacterial processes in their intestine. Human subjects receiving a K-free diet for about a week still have a large quantity in the lipoid fraction of the fæces. Urine does not contain the vitamin even when the diet is rich in green vegetables.

It is known that lack of bile in the intestine due to obstructive jaundice or to a bile fistula leads to a hæmorrhagic diathesis and the view has been held (Vadsten 1936) that decreased absorption of fat-soluble vitamins may be the cause of this condition. The only fat-soluble vitamin that is known to prevent a hæmorrhagic diathesis is vitamin K, and it is therefore of great interest to know whether this substance is the one involved in this or other hæmorrhagic conditions in man. The view might also be held that the normal human organism has the power of synthesising the vitamin and that the synthesis is stopped in certain pathological conditions associated with a hæmorrhagic tendency.

METHOD OF ESTIMATION

We have elaborated a method that enables a rapid investigation of the possible relation between human diseases and avitaminosis K in chicks (Dam and Glavind 1938b). This method is a modification of that developed by Albert Fischer (1930) for avian blood, rendered available for human and mammalian blood by the addition of a certain quantity of heparin. The action of the blood-platelets in the clotting process is thus completely eliminated, but the power of the plasma to react with tissue extract is not impaired to such an extent that it is impossible to measure the clotting power and thereby to estimate a reduction of the coagulability of the same kind as is met with in K-avitaminous birds. The method is as follows:—

From an arm vein 4 ml. of blood is taken through a paraffin-coated cannula into a paraffin-coated centrifuge tube containing 0·2 ml. water with 0·3 mg. of a heparin preparation having a coagulation valency of 0·40. The contents are gently mixed, cooled in ice and centrifuged. The plasma is tested in Fischer's apparatus by placing 4 drops into a micro-test tube mounted in a suitable frame and adding 1 drop of a human brain extract, which has been stored in ampoules in frozen state. By placing the frame in a constant water bath and turning it at intervals of 15 sec. the clotting time is measured.

Repetition of the experiment with varying concentrations of the tissue extract enables one to determine the concentration that produces clotting in 3 min. The concentration (Kn) corresponding to a normal human plasma does not vary much for different individuals when a constant tissue extract is used. The concentration (KK) corresponding to a plasma with materially reduced prothrombin is much higher. The quotient (R = K/Kn) indicates the reduction of the clotting power against tissue extract. The reciprocal value 1/R will be a direct measure of the clotting power. For K-avitaminous chicks the R value is increased and may in fully developed cases be 100 or more. This increased value is also found when heparin has been added to the birds plasma. For normal persons the R value is theoretically 1, but there is a limited individual variation. When plasma has been stored for some hours before the estimation is made, figures between 0·6 and 1·7 are still considered normal.

RELATIONSHIP WITH CERTAIN DISEASES

A summary of an investigation of certain diseases which may be expected to influence the R value is given in the Table (Dam and Glavind 1938b). It is seen that a very reduced platelet count has no influence on the R value. Normal values are also found in hæmophilia, a fact in accordance with the view held by Howell and Cekada (1926) that the coagulation defect of this disease is confined to the platelets, and in contradiction to the view of Patek and Taylor (1936) that hæmophilia is caused by a change in prothrombin. It is further to be expected

that attempts to treat essential thrombopenia and hæmophilia with vitamin K will be in vain. The few cases of sprue (without hæmorrhagic diathesis) and of acute hepatitis must be supplemented by others before definite conclusion may be drawn from the normal R values found in these conditions. In the last group—obstructive jaundice from different causes—5 out of 7 cases have definitely raised R values. All do not show spontaneous hæmorrhages, but it is to be supposed that these may be seen sooner or later when the R value is increased.

TABLE SHOWING DISEASES AFFECTING THE R VALUE

Disease.	R value.	Thrombocytes (thousands per c.mm.).	Tendency to spontaneous bleeding.
Thrombopenia	1·0	6–12	+
	0·74	40–50	+
	0·65	12– 3	+
	0·8	26	0
Aplastic anæmia	0·8	40	+
	1·0	10	+
	1·3	Normal.	+
Hæmophilia	1·2	"	+
	1·0	"	+
	0·7	"	+
Non-tropical sprue (adult)	0·75	"	0
	1·4	"	0
Myeloma	0·6	"	0
	0·9	"	0
Acute hepatitis	2·7	"	0
	2·0	"	0
	1·1	"	0
Obstructive jaundice—			
Cholelithiasis	1·0	"	0
Cancer	10·0	"	0
"	23·0	"	+
"	5·6	"	0
Cholelithiasis	5·4	"	+
Cancer	9·0	"	0
Cholelithiasis	1·1	"	+

A series of investigations that need not be detailed in this paper (Dam and Glavind 1938b) render it highly probable that the increased R values in this group are due to reduced prothrombin, and the view that obstructive jaundice is associated with reduced prothrombin has also been held by Hawkins and Brinkhous (1936).

CLINICAL TRIAL

It is known (Dam, Glavind, Lewis, and Tage-Hansen 1938) that an intravenous injection of a vitamin-K concentrate may restore the clotting power of the blood of K-avitaminous chicks in about 5 hours; an intramuscular injection is also very active, even if a somewhat longer time is required, while for a subcutaneous injection it is necessary that the vitamin should be in a water-soluble form.

We have therefore given intramuscular injections of K-vitamin concentrates to three of the patients with increased R values.

In the first—a case of obstructive jaundice due to cancer—having an R value of 5·6 immediately before the injection, the patient got on 3 days 15 mg. of a K concentrate with a strength of 3000 units per mg. (The units are related to a standard dried spinach containing 550 units per g.; the injected quantity therefore corresponds to 90 g. of dried spinach per day.) On the fifth day after the first determination the R value was 1·3 and after a further two days it was 1·2.

In the second case—obstructive jaundice due to cancer—the R value was followed through a longer period before the injection. The initial value found for R was 23; 13 days later it was 21, and 51 days later 78. Immediately afterwards the patient received in 5 days 15 mg. (50,000 units) per day by intramuscular injection—corresponding to approximately 1 unit per g. body-weight; on the sixth day R was found to be 1·4.

In the third patient—a case of cancer—the initial R value 9 rose to 33 in the course of 20 days. The patient now had intramuscular injections of vitamin K (45,000 units per day) on 4 subsequent days. On the fifth day the R value was found to be 4 and on the seventh 2·8.

CONCLUSIONS

It is thus justifiable to conclude that the parenteral introduction of vitamin K has rendered the clotting power normal and that the increased R value before the introduction was due to reduced absorption of vitamin K from the intestine.

Animal experiments with bile fistula rats have been carried out by Greaves and Schmidt (1937) who found that an excess of vitamin K in the food counteracted the hæmorrhagic diathesis, and after the present work was finished Warner, Brinkhous, and Smith (1938) reported that the action of alfalfa extract mixed with bile and given by mouth was superior to the usual bile therapy.

We are aware that the experiments given in this preliminary communication must be supplemented by a careful clinical investigation, but the fact seems already to be secured that the treatment with parenteral introduction of vitamin K will completely substitute the old bile therapy.

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Clinical and Laboratory Notes

OBTURATOR HERNIA

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ACCORDING to Erichsen (1884) the condition of obturator hernia was first noticed in the early part of the eighteenth century. The condition is rare and most of the reported cases have occurred in women over 60 and often there is a history of emaciation following obesity. The following factors affecting the ætiology are generally accepted: (1) The obturator opening is relatively larger in women than in men. (2) Frequent pregnancies cause laxity of the peritoneum. (3) Emaciation removes the cushion of fat normally occupying the obturator canal. (4) Extraperitoneal lipomata may account for the origin in some cases.

Lejars (1936) describes three types:—

(*a*) The sac traverses the entire length of the obturator canal from behind forwards and emerges from the anterior orifice and spreads out in front of the obturator externus and under the pectineus.

(*b*) The sac emerges between the upper and middle fasciculi of the obturator externus and becomes encircled and constricted by a double muscular band.

(*c*) The sac burrows from above downwards between the two layers of the obturator membrane and remains entirely behind the obturator externus muscle.

Generally the condition has been discovered during laparotomy for acute intestinal obstruction; occasionally obstruction associated with a fullness in Scarpa's triangle and pain referred to the distribution of the obturator nerve has led to the correct diagnosis being made before operation. Even more rarely the diagnosis has been made before strangulation or obstruction has occurred. Milligan (1919) describes such a case in which he was able to approach the canal and repair the hernia from the inguinal route. Rendle Short (1923) records having found the condition at operation for acute obstruction.

On account of the patient's condition no attempt was made to close the obturator canal after the hernia had been reduced. After 21 months, at the age of 77, the patient presented herself again with a recurrence of obstructive symptoms. The hernia was again reduced from within the abdomen and, on this occasion, the canal was closed by cutting a piece of rib cartilage corresponding in length and diameter to the canal, inserting this into the canal, and drawing the peritoneum over it by means of a purse-string suture. No attempt was made to identify the position of the vessels and nerves.

A better method of dealing with the sac is that suggested by Grey Turner (personal communication), namely, to invert the sac from within and place a ligature around its base. To do this a pair of artery forceps is inserted through the neck of the sac grasping the fundus. The sac is inverted by drawing the forceps out again.

CASE REPORT

A widow of 68, having one grown-up son, was admitted to Hammersmith Hospital on Oct. 30th, 1937, complaining of abdominal pain and vomiting of four days' duration. The pain, which was colicky in nature, was situated in the umbilical region and did not radiate. It varied in intensity but never left her entirely. She vomited 4½ hours after the onset of the pain without relief. She took nothing by mouth except sips of water. She vomited again five or six times during the four days and she volunteered the statement that the vomit gradually became "like her motions." She passed a small motion on the second day, but no flatus during the whole of the four days. In her past health she had been becoming increasingly constipated during the previous twelve months. During the same period she suffered from a troublesome cough and flatulence and discomfort after meals. She had noticed a small swelling in the midline of the neck, which had been present for forty years and had never caused her any trouble. She did not think that she had lost weight recently.

On admission.—Slight generalised wasting. Cyanosis of lips. Temperature 98° F.; pulse-rate, 76; respirations, 20. Tongue clean and moist. An adenoma of the thyroid, the size of a walnut, was present in the midline. She complained of colicky pain in the umbilical region, but was not vomiting.

The abdomen was slightly and uniformly distended; no visible peristalsis. On palpation it was found to be soft and slightly tender all over. The lower border of the liver was palpable. No other organs and no masses could be felt and a careful examination of the hernial orifices showed no abnormality.

By auscultation, peristalsis was increased all over the abdomen. Heart and lungs: râles at both bases; blood pressure 130/70 mm. Hg. Rectal examination: no abnormality found. Urine: trace of albumin.

Diagnosis.—Acute on chronic obstruction.

Operation under a spinal anæsthetic (10 c.cm. of Percaine 1–1500). As a preliminary to operation a duodenal tube was introduced through the nose and 6 oz. of thin, brown, fæcal smelling, intestinal contents withdrawn. An injection of omnopon gr. ½ and scopolamine gr. 1/150 was given. The abdomen was opened by a low right paramedian incision and free, straw-coloured fluid was present in the peritoneal cavity. Distended and reddened loops of small intestine were seen. The cæcum was not distended. A loop of collapsed small intestine was found and followed down into the pelvis. It had herniated into the right obturator canal. After gentle traction had been applied from within, the hernia was reduced and it was seen that there had been a Richter's type of strangulation involving a circle of bowel wall ½ in. in diameter. The affected portion was dark red in colour and bulging. The gut appeared viable and peristalsis appeared while it was being watched. Two catgut interrupted Lembert sutures were introduced to infold an area over which the peritoneum appeared to be damaged. An examination was made of the obturator opening and it was found barely to admit the tip of the little finger. No attempt was made to repair the obturator canal and the abdomen was closed. The nasal tube was allowed to siphon throughout the operation and 10 oz. of foul-smelling, brown fluid escaped in this way.

Progress.—After the operation the patient was given 800 c.cm. of intravenous glucose saline slowly. The nasal tube was left in situ and aspiration was carried out periodically after the operation (see Table). She was encouraged to drink after each aspiration. The volume of aspirated fluid rapidly diminished and within a few hours lost its fæcal smell. Her convalescence was interrupted by the formation of a subcutaneous hæmatoma, but in five weeks she was discharged from the hospital feeling well and with the wound soundly healed.

TABLE OF ASPIRATIONS OF STOMACH THROUGH DUODENAL TUBE

Time.	Amount aspirated (oz.).	Time.	Amount aspirated (oz.).
FIRST DAY		SECOND DAY	
5 P.M.	6	1 A.M.	1½
In theatre.	10	3.20 A.M.	2
8 P.M.	5	4.30 A.M.	½
9 P.M.	1½	6 A.M.	½
10 P.M.	1	8 A.M.	½
11 P.M.	1	10 A.M.	½
11.45 P.M.	½	11 A.M.	Tube out.

An inquiry was afterwards made as to the presence of pain referable to the obturator nerve, but it was found to have been absent.

CONCLUSIONS

(1) Diagnosis is seldom made except at operation.

(2) Pain referred to the inner side of the thigh is inconstant.

(3) Owing to the variations in the relation of the hernial sac to the obturator vessels and nerve, the approach from the thigh is hazardous and should not be attempted.

(4) As in all cases of obstruction, the use of the duodenal tube, as advocated by Wangensteen (1937) is a therapeutic measure of inestimable value.

I am indebted to Prof. Grey Turner, director of the department of surgery, and to Sir Frederick K. Menzies, chief medical officer of the L.C.C., for permission to publish the report.

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A NEW TECHNIQUE IN EMBOLECTOMY

By D. Lang Stevenson, F.R.C.S. Edin.

RESIDENT SURGICAL OFFICER AT THE WOOLWICH AND DISTRICT WAR MEMORIAL HOSPITAL

I had the opportunity recently of removing an embolus from the main artery of the upper limb. The use of a special needle proved so effective in facilitating an operation that might otherwise have been difficult or even unsuccessful, that the method seems worth recording.

In this case an embolus had lodged in the upper part of the brachial artery. The vessel was exposed in its upper third and was found occluded with clot from where the profunda branch is given off to beyond the exposed part of the axillary artery, at which level transmitted pulsation could be detected. The lower part of the thrombus was withdrawn by means of forceps and probe, but it became increasingly difficult to extract the upper part of the thrombus by the usual manœuvres. At this stage a special needle was used which it had been anticipated would prove useful. This needle was described recently (Stevenson and Walker 1938). It is 10 in. long and has a ball on the end a little over ¼ in. in diameter, through which the needle passes. The needle was inserted up the artery as far as the clot and suction applied by means of a Record syringe. A long piece of thrombus was easily withdrawn adhering to the needle like a limpet. The small spurts of blood that followed indicated that some clot still remained in the upper and unexposed part of the axillary artery. This time the needle was passed up for a distance of about 5 in., strong suction being maintained all the time. The remaining portion of thrombus was withdrawn followed by a gush of blood. The incision was closed and the circulation in the limb restored.

From this experience, and that gained from seeing four other embolectomies, it is thought that the manœuvre should be a real advantage in making the operation quicker and simpler as well as more certain of success, especially where secondary thrombus extends for a considerable distance into the more inaccessible part of the artery. In the case just described it is probable that if this needle had not been available a much more extensive dissection would have been required necessitating division of the pectoral muscles and even further incision of the vessel itself.

The technique has thus several advantages. The smooth ball end does not damage the delicate intima. A very small incision, just large enough to admit the head of the needle, is sufficient. It is suggested that a transverse incision might have an advantage over the usual longitudinal one, since it causes less constriction of the lumen when sewn up. The ball-ended needle is also useful for the purpose of syringing out the vessel with citrate solution before closing the incision.

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MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF PHYSICAL MEDICINE

At a meeting of this section held on March 18th the chair was taken by Dr. F. D. Howitt, the president, and a discussion on

Physical Education

was opened by Lord Dawson. He said it had an important bearing on the crisis in which the nation was concerned. The country had had a call, not to arms, but to gird up its loins. Planning was essential for a strength in manhood as in everything else. Modern physical education might be said to have originated in Denmark in 1804 when it had been made a part of the school curriculum. The idea had fallen on stony ground in this country, so long the home of games. In 1915 the gymnastic movement had come to the fore, an important part having been played by the British Army. Athletics, games, and folk dancing were used to ensure strength, suppleness, and beauty, and to develop the team spirit. The combination of physical training with games and sports, advocated by Niels, was the method of choice in Great Britain. The Board of Education had steadily extended its field of physical education, which to-day occupied an important place in the curriculum of elementary schools. Further, the Army school of physical training had acquired increasing reputation and influence. On the other hand, universities and public schools had been slow to admit that their system of games needed to be supported by a system of training. Naturally, the rising enlightenment had not as yet direction proportional to its force. Thus arose the importance of the medical profession making this subject its own. Knowledge of the growth and health of the body rested on the medical sciences. The medical man was an educationist of the body as the schoolmaster was an educationist of the mind, and they needed to work together. Imposition of a central plan by the Government would have upset and antagonised local activities and might have raised the bogy of militarism. Therefore the slower methods of the Council of Physical Training and grants-in-aid were pursuing their way.

Games produced a harmony of body, mind, and character, but deficiency in games might not argue defect of frame or function, and games might overstrain their votaries. There was a tendency to focus attention on boys who had the aptitude to do well, so that the dull or mediocre players left school with uneducated bodies. Sports and games were the fulfilment of physical training and should rest upon it. It developed qualities which were basic: posture, poise, flexibility, rhythm, and good respiration. Good posture was not innate but had to be taught—perhaps because the erect posture had been but recently evolved. It was first a conscious effort of the cortex, but later passed to the control of the mid-brain, and so became natural. Given good posture and good carriage, all other things would be added. Body and mind worked together. Muscles and nerves must be well nourished and adequately rested; thus posture involved sound nutrition and sleep. Muscle relaxation was precedent to any repose of mind—a fact not fully recognised by doctors. Often muscles and nerves remained taut after work was finished. Much could be learned from observation of a good sporting dog. The time had come to survey accepted principles in the light of physiological knowledge. Research had greatly enriched this field of knowledge in recent years. The postponement of fatigue by sugar, the raising of glycogen reserves by two days' rest before effort, and adequate rest after effort were examples. Basal metabolism during training increased; according to theory it should decrease as the machine got run in. The metabolism of muscle was not agreed on, but no one doubted the importance of an adequate supply of oxygen. The

oxygen debt a man could incur depended on training; the strength and coördination of the respiratory muscles conditioned his success in games and sports.

If this was to be a nation-wide movement there must be more and the best provision for training teachers. These services had not been accepted as of primary national concern in this country in the way they had in Scandinavia. The Government had decided to establish a college where anatomists, physiologists, and teachers of physical training would work side by side, studying the whole man. Physical education would need the responsible guidance of trained doctors. School medical officers in the future ought to have a course in the national college. A new sphere of work was opening out for young doctors, whether as a specialty within general practice or as part of the sociological services which were bound to come more and more into prominence. Moreover, the physiology of work and leisure offered an interesting field of inquiry. Physical training must not lose touch with the cognate subjects of right feeding and adequate repose. The increase of scientific knowledge and of the social conscience had caused survival of a larger and larger number of the unfit. An alternative policy to Nature's "survival of the fittest" must be instituted. The task was made more difficult by increasing urbanisation; by increasing specialisation in industry, leading to over-development of one part and under-development of the whole man; by machinery; and by speed, which encouraged the ready-made rather than the self-made. The best of the youth should be pushed to the fore, so that youth leaders created a standard for their own generation. Loans might be granted to medically approved marriages; and we should establish motherhood clinics, and otherwise plan for improved stock. Competitive examinations should be made a test of physical as well as mental fitness. No standard type of body was wanted; quality, proportion, and effectiveness must be considered.

A SURVEY OF EUROPE

Prof. B. A. McSWINEY described his tour of European countries in the interests of physical education. He had visited Copenhagen, Lund, Amsterdam, The Hague, Paris, Rome, Vienna, Prague, Warsaw, Berlin, Dresden, and Munich. The purposes of physical education varied considerably in different countries. The attitude in Denmark was to ensure uniform bodily development and control, and to be sure that the child had moderate strength and an idea of discipline. In Italy the idea was to inculcate a faith and conception of life, to make all young people form a part of the State, and to teach them to live dangerously. The masses were to acquire discipline and will and to be organised in a military manner. There was a general movement in most countries to stimulate interest in exercise, but games did not take a prominent place. It was impossible to provide sufficient playing space in cities, and gymnastic work had certain advantages. In some countries the climate prevented outdoor sports for several months of the year. Too much attention had been paid to rigid systems of training in the past, and for this reason gymnastics were not universally popular; flexible methods were being developed on eclectic principles in all centres. The investigators had concluded that an international system would be impossible and was probably not desirable; what suited one nation did not suit another. No system was founded on exact knowledge of the effects of exercise on the functions of the body. The time allotted in schools varied from one to five hours a week, and other subjects were considered first. Unfortunately the exercises could not be arranged on a basis of equal fitness, but must be on the ordinary class basis. In many areas the otherwise useless roof space was utilised for gymnasia. In Germany the aim was a daily exercise, swimming instruction, and uniform physical education. Children received tests before leaving the elementary school. The young people received further training in the Hitler youth organisations. In most European countries no special provision had been made for adolescents, adults, or the unemployed, but private clubs were numerous and active in Sweden and Denmark. In Italy and Germany boys and girls passed from the children's clubs into young Fascist organisations which kept the girls till the age of 25 and the boys until their military service. There were clubs for the unemployed and for private members in Italy, both for men and women. In Germany the lad of 19 left the Hitler youth and joined the Labour service before military service; after that he joined sports clubs and party organisations which offered facilities for all kinds of sports and games. There seemed to be little coöperation between school medical officers and physical instructors—"sports doctors" judged the capacity of boys to participate in exercise, but had no opportunity to estimate results. Too much rested on the teachers. Medical men taking up school work ought to have a special period of study. In some centres fine work was being done for the below-normal physical type, but on the whole these people were rather neglected.

There was little knowledge of the effects of exercise on the functions of the body. It was an important factor in development and increased muscle strength, coördination and efficiency, and developed flexibility of joints and good posture. It trained the body to work more efficiently. In moderation it caused a sense of well being, but there was no evidence that it made the body more resistant to disease. Physical education could not be developed as a separate subject; the close connexion with nutrition must be recognised. Attention should be paid to children and adults whose condition was below normal. The medical man must be trained so that he was able to take over the control of the nutrition and physical education of school-children. The profession must realise the problem that faced it in understanding the development of the body and the resulting gift of health.

PHYSICAL TRAINING AND THE SOLDIER

Major W. CAMPBELL said that the first whole-time medical officer to the Army training school had been appointed in 1922. A hygiene specialist had been selected, and preliminary training had been essential. The training had begun with three months' physical training to teach him what the exercises meant; then there was a course in the physiology of muscular exercise and energy expenditure. In the school he had to discuss matters of physical training with instructors of great experience. There was thus close liaison between the teaching and the medical side. The officer's duties included instruction and research. Physical training was based on medically sound lines, and the future instructors were taught anatomy and physiology by the medical officer, with the aid of the skeleton and the living model. First-aid instruction was included in the advanced and vocational courses. Routine tests and charts were made for all the men, including vital capacity, reaction times, grip-test, and exercise-tolerance tests. Research included an inquiry into energy expenditure to grade the various

exercises, and the effect of smoking on endurance. There were exceptions to the obvious rule that smoking militated against endurance. An inquiry had been made into the value of rhythmical breathing in walking.

Usually four courses were running: probationers', vocational, assistant instructors', and advanced. The assistant instructors were young men chosen by their superior officers for a three months' course; the most promising took the advanced course for another three months. The best of these were recalled later from their depôts, after teaching experience, for the probationers' course, and these again, after further experience, might be selected for the staff.

DISCUSSION

Sir ARTHUR MACNALTY pointed out the uselessness of preaching physical fitness to an unresponsive nation; of recent years there had been increasing interest in the open-air cult, due to urbanisation, better wages, more holidays, Boy Scout and Girl Guide movements, and better knowledge of the laws of health. Progress in physical education in schools followed several lines of advance. The old-fashioned cramped school was being replaced by light, airy buildings with ample playing grounds. Nutrition was attended to by local authorities; proper meals and sufficient milk were essential. Health demanded a right habit of living, and the Board of Education regarded adequate physical training as an essential part of the child's education. Without trained teachers and leaders the fullest use could not be made of the facilities available. Full use should be made of the services of preventive medicine, lest zeal outrun discretion. One part should not be developed at the expense of another, and the body should never be developed at the expense of mind and spirit. Exercises might be misused and misapplied. There was great need for watchfulness in observing their effects, and for caution that they were not overdone.

Mr. PHILIP WILES said that the rapidity with which the Government scheme of physical training had been introduced had caused some doubts among the medical profession, but Lord Dawson had gone far to allay those doubts. Undoubtedly the physique of the nation was in a bad way, and one method of improving it was physical education. But a quarter to a half of the population were receiving less food than they ought; and in those circumstances doctors had to be careful how they advised people to take on the additional effort of physical training. No one should be encouraged to join such schemes unless they were getting enough to eat to ensure that they derived benefit. In Moscow everyone who joined a sports club had to be examined by a specially trained medical man before participating in its activities. Not only the apparent fitness but also the amount of food available needed to be taken into consideration.

Sir ROBERT STANTON WOODS said that the Aldershot school was a school in the best sense of the word; it should be inspected by all interested in the subject. It was the inescapable duty of every medical man to afford help to the limit of his capacity and opportunity. Education of the body was the preventive side of physical medicine. He pleaded earnestly for the stimulation in every teaching hospital of an active interest in this branch of medicine and hoped people would not be easily discouraged by opposition.

Lord DAWSON, in reply, urged that caution should not be a shelter for inertia.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

A MEETING of this society was held on March 18th, with Dr. JAMES FENTON, the president, in the chair.

Dr. ARTHUR MASSEY (Coventry) opened a discussion on

Hospital Policy in Relation to Preventive Medicine

by drawing attention to the germ of a coördinated hospital policy for the country, contained in the provision of the Local Government Act, 1929, that local authorities must consult with the governing bodies and medical staffs of the voluntary hospitals in their area on questions relating to the provision of hospital accommodation. This proviso did not, however, appear to be reciprocal. Nevertheless, in the more progressive and enlightened areas a great deal of progress in liaison with the voluntary hospitals had been made, particularly through the appointment of the medical officer of health to the staff or to the management committee of the local voluntary hospital. In Coventry they were making a new departure with a joint laboratory under a committee composed in equal numbers of representatives of the voluntary hospitals and of the public health committee. One difficulty, which had been overcome in most areas, was that contributors to Hospital Saturday funds and other contributory schemes were liable to find themselves in the position of having to pay twice over, in that their contributions did not entitle them to free treatment in the municipal hospitals.

What sort of quantitative provision of general hospital beds must local authorities provide? There were no general standards. It was conceivable that the Midwives Act, 1936, might have the effect of relieving the pressure on maternity beds by popularising domiciliary midwifery once more. As showing the very great increase in the demands made on the beds in municipal hospitals, Dr. Massey quoted figures from his own hospital at Coventry, showing that the number of patients passing through it in 1937 was three times greater than in 1927. As regards out-patient departments, it was not true that the provision of municipal out-patient departments relieved the pressure on those of the voluntary hospitals. A circle seemed to be set up in which the supply increased the demand. Opinion was sharply divided on the provision of municipal out-patient departments, particularly as to whether they should provide consultant services only or a general out-patient service. In internal administration, whereas the voluntary hospitals were almost exclusively administered by lay persons, the municipal hospital was run by a medical administrator and Dr. Massey put in a strong plea for the continuation and extension of the latter system.

Finally, Dr. Massey suggested that the future development of our hospital system might lie in the direction of a coördination of graded hospitals in regional areas. Regionalisation was easy for voluntary hospitals but raised serious administrative difficulties with municipal ones. However, since 60 per cent. of the general hospital beds of the country were in the hands of local authorities, the municipal hospitals could not possibly be ignored in any regional scheme. The final model had not yet been evolved and progress must be by evolution and not by revolution.

Dr. J. FERGUSON (Surrey) thought that the development of public hospitals in the last eight years would prove to be as revolutionary a change in public health as the development of maternity and child welfare schemes in the early years of this century and that of sanitation in the first half of the nineteenth century. Indeed some medical officers feared that the attention given to hospitals might distract the medical officer of health too much from the more fundamental duties in connexion with preventive medicine, such as sanitation. Dr. Ferguson was not in favour of the complete absorption of voluntary hospitals into a uniform system but he felt that in many cases they had increased their accommodation regardless of failing income and that they should lay down for themselves a definite policy of limiting their services in order to prevent their income from being outstripped. The total quantity of beds required for general hospital purposes was probably round about four per thousand of the population but must necessarily vary with local conditions. In London the number provided was considerably higher, while in Surrey, which provided 1·6 voluntary beds per thousand of the population, they had estimated that 2·5 municipal beds per thousand would be required as a minimum and it was on that basis, for example, that the new 850 bed hospital at St. Heliers and the other great extensions now envisaged by his council were being undertaken.

He was not sure that the pendulum had not swung too far against the value of the isolation hospital as a preventive measure against infectious disease. Isolation hospitals were only a link in the chain, whose strength must be that of its weakest link. The public now rightly demanded that accommodation in isolation hospitals should be not less good than that in general hospitals and isolation hospitals had now to deal with a far greater variety of diseases and had to restore the patient completely to health, in addition to saving his life and isolating him from his fellows. The movement which had resulted in centralisation and the closure of the smaller hospitals was excellent; he thought that a minimum of 100 beds with a resident medical officer should be the standard to be aimed at. He was entirely in favour of concentrating the special departments such as chest blocks, tuberculosis, venereal disease, ophthalmic, rheumatism, and mental clinics at the general hospital. The V.D. and mental departments could only be effectively run if they had in-patient beds attached to them and this principle had been accepted by the Surrey county council at the St. Heliers hospital. Finally, he thought that an important plank in public hospital policy must be to raise the working conditions of the nursing and other staffs employed in them.

In reply to Dr. FENTON, Dr. FERGUSON agreed that hospitalisation was not always the best policy for young children, but they were forced into it by public demand; the 120 beds for children provided at St. Heliers were divided into wards of which the maximum number of beds in any one ward was four. He also agreed that research should not be dependent on charitable funds and must not be overlooked in municipal hospital organisation. Hospitals for the chronic sick were becoming preventive in character, since so high a proportion of the chronic sick could now be successfully treated.

The subsequent discussion produced a general agreement that municipal hospital progress since the passing of the Local Government Act, 1929, had been—to quote Dr. Elwin Nash—"staggering" and that the provision of an essential service such as hospital treatment could not much longer continue to depend, even in part, on appeals to public charity.

HUNTERIAN SOCIETY

Painful Feet

AT a meeting of this society held on March 21st, the chair was taken by Dr. DONALD NORRIS, the president, and a discussion on painful feet was introduced by a surgeon and a chiropodist.

SURGEON

The feet, Mr. NORMAN LAKE remarked, differed from the hands in that, apart from infections and injuries, painful conditions sometimes arose in them without any obvious cause. The solution of the riddle could only be found in the evolutionary history of the foot. The human foot was undergoing regression from a highly complex structure to a stereotyped one. Not only was the civilised foot encased in footwear, but the ground was artificially levelled for it, and it had merely to be placed on a level surface and to propel the body forward. In the pre-human apes, the great toe had been a separate structure like the thumb, capable of opposition to the rest of the foot. Its absorption could be followed by a study of the existing anthropoids. The incorporation of the great toe into the rest of the foot was quite recent, and the separation of its metatarsal bone from the others was the commonest of the painful conditions which occurred in the foot.

Along with this change, the size of the great toe had increased until it usually equalled the second toe in length. In the apes the first metatarsal was called upon to carry very little of the body-weight, most of it falling on an axis passing between the second and the third. Stresses would be distributed between those two bones. As a result, they were fairly stout, but the first was relatively thin and weak. In the human foot, the "axis of Morton" had passed to the interval between the first and second, and the stresses therefore now fell largely upon the first in the standardised mode of progression required of modern man. An evolutionary process of this kind was generally accompanied not only by weakness but also by variations. The relative lengths of the first and second metatarsal bones varied widely in individuals. Many foot troubles arose from the conflict between these variations and the stereotyped action required of the foot. Only the foot which had undergone the complete human cycle was suited to its work.

It was a mistake to be too optimistic in a case of pain due to atavistic lack of absorption of the inner segment of the foot. The characteristics underlying it were inborn. The object to be aimed at was to bring some of the strain of locomotion back on to the first metatarsal. The first segment was, however, obviously a very unstable segment in itself, and therefore if all the strain were thrown back on to it, difficulties would arise from its incompetence. The incidence of the strain must be shared by the toes: the second and third must be relieved as much as possible and more weight thrown on the first and fourth. When the second toe was unduly long and had been subjected to undue strain, or to wear and tear such as might produce an arthritis of the second metatarso-phalangeal joint, and where the first was properly stabilised, it might be better to throw all the strain back on to the head of the first. The alteration of stress was not easy. An attempt

might be made to push the heads of the second and third metatarsals up out of the way by fitting a metatarsal pad immediately behind the head so as to raise it out of the position of carrying-strain in contact with the ground. Alternatively, an attempt might be made to build up the ground—i.e., by placing a support beneath the head of the first metatarsal so that it met the platform early and carried a greater portion of the weight. Modern footwear was not as bad as it was often represented, and—except for the feminine high-heeled shoe—it did not cause much unexplained pain. Primitive peoples who wore no shoes displayed almost as many painful deformed and ugly feet, with hallux valgus, hammer-toes, and so forth, as modern civilised people.

CHIROPODIST

Mr. J. H. HANBY, president of the Incorporated Society of Chiropodists, said that the most important material for the treatment of painful foot was felt. This was made in various thicknesses and compressions, ranging from a soft cushion to the hardness of piano-felt. The surface was often spread with an ointment. Sponge rubber was durable and had valuable applications, but was heat-producing and so a potential irritant. The two main purposes of padding and strapping were correction and protection. The general principle governing protective padding was equalisation or relief of pressure without interfering with general alignment. Corrective padding was used in an endeavour to bring into alignment those deviations from the normal which were sufficiently supple and amenable, and to assist in promoting the proper function of the foot. If the felt were not properly applied, it might do considerable harm. The pads had to be correctly shaped with scissors and the edges bevelled. When a pad was placed upon a foot at rest, the patient invariably dorsiflexed the toes, and immediately he stood up the pad would buckle in the centre. It should therefore be applied with the foot in exactly the position it would occupy in use.

Mr. Hanby showed various shapes of pads to protect various parts of the bony structure. Some patients, he said, especially in private practice, suffered from vascular corns under the first metatarsal bone, usually due to high heels and their traction on the extensor longus hallucis. In metatarsalgia, or "Morton's toe," relief could sometimes be given by placing a pad down the shaft of the fourth metatarsal, sometimes with a band round the foot. For a short first metatarsal the pad was taken directly over the head and extended into what should be its normal position. A depression was made underneath the head, so that the pressure was evenly distributed from the base to where the first metatarsal should be in the normal foot. The pad was brought underneath the shaft of the second so as to raise it slightly out of the way. He described the treatment of pes cavus, and remarked that much controversy existed over the question of whether there was a transverse arch. More trouble was seen under the heads of the second, third, and fourth metatarsal bones than in any other part of the foot. The correcting pad ran slightly inward to conform to the shape created by the metatarsal shafts, and passed immediately behind the heads so that the pressure was distributed over a large area.

A large number of thickened, malformed nails could be reduced almost to normal with the electric nail drill. This was painless, and of benefit to elderly patients to whom operation was neither acceptable nor desirable. In epidermophytosis the procedure had been to reduce or obliterate as much as possible of the fungoid tissue so that the dermatologist's treatment would be facilitated. Stockings were as important as shoes in bringing about deformities and painful conditions of the foot. The standardisation of footwear would only touch the fringe of the problem, for individual feet differed very widely. The task of the chiropodist would be made easier if shoe manufacturers would market shoes in lefts and rights and not in pairs.

DISCUSSION

Mr. C. LAMBRINUDI said that Guy's Hospital was the first to appoint a chiropodist in working coöperation with an orthopædic surgeon. So successful was the experiment that within a year an assistant had been found necessary. The chiropodist was as necessary as the masseur, for he not only eradicated painful peripheral foci but also cleared up corns, adhesions, and other troubles in the presence of which massage could not be used. The tips of the toes were quite as important as the metatarsal heads. From the physiological point of view, two reflexes had to be considered: that which inhibited the action of the interossei, and that which made them contract synchronously with the flexors. The afferent impulse for the prehensile action was a deep sensation; that for the ambulatory action arose from the skin of the soles of the feet. The work of the chiropodist was founded on a physiological basis, for if there were a painful focus on the foot the nociceptive stimulus predominated, and so the normal stimulus to the sole of the foot could not operate and the toes could not act properly.

Dr. J. B. COOK confirmed the value of chiropodists, and said he intended to do his utmost to assist them in their claim for recognition and to have one appointed at his own hospital without undue delay.

Dr. JACQUES FORESTIER said that he had not previously understood why any particular form of osteo-arthritis should be situated in any one of the metatarsal bones. Rheumatologists might learn much from Mr. Lake's explanation. He considered that some circulatory trouble was involved in Morton's metatarsalgia, for pain might come on suddenly without relation to pressure. Lipiodol injections between the metatarsal heads had given excellent results in a number of cases. Another case of pain in the foot might be papillomata of the sole; X ray treatment was effective in destroying these growths.

Dr. G. B. HEGGS said that the commonest infections of the foot were fungous infections and plantar warts. Both occurred in patients with moist and soft skin, and abnormal pressure was a secondary factor. Stockings were important. Many patients had corns due to fungous infection between the fourth and fifth toes, which were found to be habitually pressed together; separation by means of animal wool was of great value. To encourage the development of hard dry skin would do much to prevent foot pain.

Dr. F. MCG. LOUGHNANE suggested, for the treatment of certain cases, the removal of the second metatarsal and the implantation of a bone graft.

Mr. A. E. MORTIMER WOOLF declared that the child was born with its feet in a position of varus, but that from the moment it began to stand it was subjected to the relics of military barbarism, for it was taught by all its elders to turn its feet out at an angle of about 45 degrees. This unnatural position had probably been imposed on soldiers to enable them to walk in close single file. The effect was to

throw the whole weight of the body on to the sesamoid bones and displace them, so that the weight fell on the head of the first metatarsals. The feet of the athlete were slightly inverted. Sufferers should be taught to get the weight on to the outer sides of the feet, a practice which gave great relief to those fatigued by much standing.

Dr. P. B. SPURGIN regretted that the boots with a depression for the big toe, manufactured by a certain firm, had gone out of use. A very common cause of pain, and one often overlooked, was chronic tenosynovitis.

Dr. E. C. YOUNG spoke warmly of the measures which had been prescribed for him many years ago: boots built up on the inner side, a partition between the great toe and the others, and socks with a separate great toe.

Dr. GERALD SLOT, speaking of his experience at a rheumatic clinic, said that about 60 per cent. of children with alleged rheumatic pains of the feet were really suffering from defects which were at once remedied by exercise and correct footwear. To be effective, treatment must be faithfully carried out for some time. Genu valgum also sometimes produced conditions of the feet which were mistaken for rheumatism, and sciatic neuritis might be referred to the feet.

Mr. J. G. JOHNSTONE added inflammation of the fascia to the causes which had been mentioned, and considered that more stress should be laid on sepsis as a cause in adults as well as in children.

Mr. REX HILTON related that American investigators had found very few deformities in the African negro. Physiology was at once disordered when a foot was shod. Physical training instructors in America now taught a position of very slight eversion.

PATHOLOGICAL SOCIETY OF MANCHESTER

AT a meeting held on March 9th, with Dr. DANIEL DOUGAL, the president, in the chair, Dr. WILSON SMITH read a paper on the

Search for an Influenza Prophylactic

He said that a virus was first isolated in 1933 by the intranasal inoculation of ferrets with throat washings obtained from cases of influenza; since then many strains had been isolated by a similar technique all over the world. The ferret disease closely resembled human influenza in its symptomatology and the ease with which it was transmitted by contact of sick and healthy animals. The entry of virus into the respiratory tract was, however, necessary for infection; virus inoculated by other routes was innocuous. A lung-adapted strain of virus had been obtained, by serial passage under anæsthesia, which caused a much more severe illness, accompanied by lesions of pulmonary consolidation. Ferrets recovered from influenza were found to be completely immune to reinfection for a few months; then the immunity waned slowly, so that for some time experimental inoculation of virus was followed by a mild disease of short duration without any lung involvement. The resistant state was characterised by the presence of virus-neutralising antibodies in the blood.

The virus had been adapted to mice, in which animals it produced a virus pneumonia. By grading the dose of mouse-adapted virus, it was possible to obtain all degrees of lung involvement from small root lesions to complete consolidation of all lobes. Other ways of propagating the virus were by growth on the chorio-allantoic membrane of the developing chick embryo and by growth in a medium consisting of minced chick embryo and Tyrode's solution.

Dr. Wilson Smith said that ferrets, mice, and eggs had all been used in the search for a prophylactic against influenza. The tests employed to gauge the effect of vaccination upon resistance fell into two main groups: (1) tests in which the animal is exposed to infection, and (2) tests designed to measure the antibody level of an animal's serum. Antibodies were measured by virus-neutralisation tests in ferrets, mice, and eggs, or by the in-vitro complement-fixation reaction. Unfortunately the results obtained by these different tests showed puzzling discrepancies with some sera, and it was not yet known which test gave the truest measure of active immunity.

Vaccination of normal ferrets conferred a degree of resistance sufficient to protect against contact infection, but insufficient to protect completely against large doses of virus inoculated intranasally. The induced partial immunity, however, saved the lungs from involvement when the lung-adapted strain of virus was used for the immunity test. Vaccination of ferrets which possessed some residual immunity as a legacy from a past attack of influenza restored the solid immunity which they enjoyed immediately after recovery. Vaccination of mice resulted in the complete protection of a high percentage of animals, a reduction of mortality-rate, and a decrease of the extent of lung involvement in those not completely protected. Experiments with mice had been particularly useful for comparing the efficacies of different vaccines with a view to obtaining the most suitable product for use in man. Prophylactic experiments in human volunteers have been carried out in England with killed virus vaccines, and in the United States with living virus inoculated by non-infective routes. In all the experiments recorded vaccination resulted in a striking increase of serum antibodies. In the United States the reduction of the incidence of febrile respiratory disease in vaccinated as compared with control groups during subsequent epidemics augured well for the possibility of controlling epidemic influenza in the future. In England an epidemic had broken out too soon after vaccination for the results to be of much value.

The problem of efficient prophylaxis was complicated by the existence of antigenically different virus strains. The differences could be demonstrated either by cross-neutralisation tests with virus strains and their homologous antisera, or by cross-vaccination experiments in mice. Such experiments showed, however, that different strains possessed some antigenic components in common, and it was hoped that an efficient prophylactic might be obtained by the inclusion of several strains.

BRITISH HOSPITALS ASSOCIATION.—The Provisional Central Council set up to consider and advise how the recommendations of the Sankey Commission can be made effective have issued a letter to the secretaries of the regions of the association asking that special meetings should be called for the purpose of considering the present region boundaries, the adequacy of the service given, and generally to advise the council on local views and wishes. The council outline what services in their view should be found in a hospital region, which normally speaking should be based upon one central or "key" hospital. Members of the council are willing to attend meetings in the various regions of the association and discuss with representatives of the voluntary hospitals their difficulties and problems.

REVIEWS AND NOTICES OF BOOKS

Heart Failure

By A. M. FISHBERG, M.D., Associate in Medicine, Mount Sinai Hospital, New York City. London: Henry Kimpton. 1937. Pp. 788. 40*s*.

THE conception of the circulation as a simple closed system of tubes through which blood is propelled by the pumping mechanism of the heart has been of great value in the teaching of medicine. This idea, which acquired greater significance with the increasing appreciation of the importance of myocardial function, now demands revision in the light of modern physiological researches. Dr. Fishberg holds that the methods evolved for the measurement of variables such as the circulation rate, blood volume, and cardiac output have resulted in a new understanding of the dynamics of the circulation comparable to the unravelling of the cardiac arrhythmias that followed the introduction of graphic methods. In the earlier chapters of his book he reviews the investigation of these variables and discusses the deviations that occur in cardiovascular disease. It is agreed that circulatory insufficiency may be due to heart failure or to extracardiac causes, although these two mechanisms are at times combined as in some cases of coronary thrombosis. The cardiac forms of circulatory failure may be grouped into the less common hypodiastolic form and the very frequent hyposystolic forms in which either the left or right ventricle may be at fault. Dr. Fishberg criticises the term "congestive" as applied to heart failure on the ground that congestion is inevitable if there is failure, even though the congestion is pulmonary and manifested solely by dyspnœa. This criticism may be accepted as valid, if only the more advanced grades of failure are under consideration; but the term is probably of value in relation to the grade of failure—"failure without congestion" implying the earliest stages of loss of reserve and "failure with congestion" denoting the objective clinical phenomenon.

The second section of the book deals with the clinical pictures of the principal forms of circulatory failure; among many valuable chapters are those devoted to the left-sided heart failure of aortic and of mitral lesions; failure in general cardiac strain (as in thyrotoxicosis); the hypodiastolic failures of pericardial disease and paroxysmal tachycardia; and combined cardiac and peripheral circulatory failure. The six chapters on treatment provide an exhaustive account not only of management and digitalis therapy but also of newer drugs such as quinidine, acetylcholine, and mercurial diuretics, and of debatable methods like thyroidectomy and the surgical treatment of anginal syndromes.

Dr. Fishberg has given the broadest interpretation to the term "heart failure," and the result is an authoritative, documented, and yet very readable treatise on cardiovascular disease from the standpoint of its all too common termination.

Modern Advances for Rural Practice

By P. C. DUTTA, M.B. Cal., F.R.C.S. Edin., Captain I.M.S., Civil Surgeon, Punjab. Calcutta and London: Butterworth and Co. (India) Ltd. 1938. Pp. 174. 6*s*.

THIS book is a collection of short papers on therapeutics issued from time to time to doctors working in the rural areas of India who lack ready access to modern text-books and medical journals. The notes are tabulated and in alphabetical order. The author has not sought to be original but has been content to summarise the views of others and has contrived to cover much ground. Thus, in the sphere of medicine, he discusses such matters as the treatment of the anæmias, the barbiturates, and the use of Solganol in tuberculosis. Many surgical conditions are considered but operative technique, except in such relatively simple procedures as the Steinach II operation for enlarged prostate or limbic paracentesis for acute glaucoma, is omitted. Prontosil in puerperal sepsis, Devegan in trichomonas vaginalis, and œstrogenic substances in senile vaginitis are some of the therapeutic measures discussed in the sphere of obstetrics and gynæcology. Just a few of the practices mentioned have already been superseded and should thus find no place in a book with this title. This is the only fault we have to find with a book that is essentially practical and should prove useful to a wider professional public than that for which it was originally intended.

Recent Advances in Pathology

Third edition. By GEOFFREY HADFIELD, M.D., F.R.C.P. Lond., Professor of Pathology in the University of London, Pathologist to St. Bartholomew's Hospital; and LAWRENCE P. GARROD, M.A., M.D. Camb., F.R.C.P. Lond., Professor of Bacteriology in the University and Bacteriologist to the Hospital. London: J. and A. Churchill. 1938. Pp. 420. 15*s*.

WHEN a book has given real satisfaction to the reader he is often reluctant to replace his well-worn copy by a more up-to-date version. There may be an excuse for a conservative attitude to a solid general text-book but the title common to the volumes of this invaluable series implies that the current edition of each should be at hand, though former issues had better not be discarded on its appearance. The usefulness of such a series indeed depends on the frequent renewal of its constituent volumes, especially those on subjects like pathology which are the growing points of medical knowledge; and it must be a matter of gratification to authors to be able to fulfil this demand—in spite of the onerous work involved.

The revision of this volume has been extensive and much important matter has been added to it. The first chapter, entirely new, deals with problems of infection with special reference to the question of the part played by bacterial allergy. The problem of allergy comes also into the discussions of lobar pneumonia, rheumatic fever, and nephritis. The chapters on the reticulo-endothelial system have been rewritten with the addition of a short review of those diseases classified as reticuloses. Many alterations have been made in the chapters on experimental cancer research, and more detailed information on carcinogenic agents has been included. Extensive developments have also been called for in the sections dealing with deficiency diseases, gastro-intestinal functions and anæmia, and disorders of the endocrine glands. Some chapters that appeared in the earlier editions of the book have been dropped, so that its size has not been greatly increased.

In the discussion on the reticulo-endothelial system some difficulty arises over the use of the word reticulum. The authors hold that this word "should be limited to be descriptive of undifferentiated

mesenchyme and the lymphoid, hæmic or phagocytic cells derived from it together with their network of reticulin fibrils." They use the word reticulin to describe the substance of which argyrophil fibres are made, and they leave no word available to denote the network itself which, after all, would seem to have the strongest etymological claim to the term reticulum.

There can be no doubt that this book deserves its popularity. It is concise and lucid, and the selection of the material is even better in this third edition than in the earlier ones. The reviews of literature are comprehensive without being too involved, and even those readers who disagree with some of the conclusions reached will admit that the evidence is fairly and judiciously weighed. The work provides an excellent survey of recent advances in pathology.

Actinomycosis

By ZACHARY COPE, B.A., M.D., M.S. Lond., F.R.C.S. Eng., Surgeon to St. Mary's Hospital; Senior Surgeon to the Bolingbroke Hospital, Wandsworth Common. London: Humphrey Milford, Oxford University Press. 1938. Pp. 248. 15*s*.

IT is curious that a disease that has been known for sixty years, and is fairly common, should still be regarded as a rarity and receive scant notice in surgical text-books. This book will certainly make actinomycosis more prominent in the minds of clinicians, lead to its earlier diagnosis, and increase the prospect of its cure. Mr. Cope begins with an historical survey, discusses problems of pathology, and proceeds to a clinical description of the disease, ending his monograph with an appraisement of the various methods of treatment. It is all done well and in an attractive style. The extensive list of references shows the author has cast his net widely, though he disclaims having read them all—an honest admission rare in medical literature. His account of actinomycosis is not only authoritative but as complete as it can be in the present state of knowledge. This attractive monograph will certainly take its place as a book of reference for all interested in the subject, and —an unusual thing for a work of reference—it will actually be read.

Medical Bacteriology

Descriptive and Applied, including Elementary Helminthology. Third edition. By L. E. H. WHITBY, C.V.O., M.A., M.D. Camb., F.R.C.P., D.P.H., Bacteriologist, Bland-Sutton Institute of Pathology, Middlesex Hospital. London: J. and A. Churchill. 1938. Pp. 372. 11*s*. 6*d*.

THIS little book is written on orthodox lines, and its popularity with students is no doubt due to the the fact that it covers, without exceeding, the bacteriological knowledge required for qualifying examinations. Within this scope it is serviceable and reliable. It ought to prove particularly useful in helping final-year students to understand the applications of bacteriology to practical medicine. There are a few minor misprints and mistakes which should not be allowed to pass into future editions. The Ziehl-Neelsen stain is described as Ziehl-Neelsen's, hofmannii is indifferently spelt as hofmanni and hofmannii (and in the index as hoffmanni), and in two places *Clostridium botulinum* is referred to as *Cl. botulinus*. The important subject of toxin and antitoxin standardisation is confusingly discussed. If the matter is not properly treated it would be best to leave it alone in elementary works. The usual term for the skin-reacting dose of toxin is *minimum reacting dose* (M.R.D.) not *minimum toxic dose* (p. 221). The author has considerable faith in vaccine therapy and there are a number of pronouncements on this subject in the book that would be considered by more sceptical bacteriologists as over-optimistic; but these small and easily remediable defects do not seriously detract from the value of the book as an introduction to bacteriology.

1937 Year Book of General Medicine

Edited by GEORGE F. DICK, M.D., LAWRASON BROWN, M.D., GEORGE R. MINOT, M.D., S.D., F.R.C.P. (Hon.) Edin., WILLIAM B. CASTLE, M.D., A.M., M.D. (Hon.) Utrecht, WILLIAM D. STROUD, M.D., and GEORGE B. EUSTERMAN, M.D. Chicago: The Year Book Publishers; London: H. K. Lewis and Co. 1937. Pp. 832. 12*s*. 6*d*.

LIKE its predecessors and companions in this admirable series this book summarises a vast number of recently published papers on clinical subjects, perhaps of varying importance and interest to general practitioners but of immense value to specialists. Part I treats of infectious diseases and gives a full account of the therapeutic possibilities of Prontosil and similar drugs. In Part II, on the extracardiac diseases of the thorax, the present position of intensive collapse therapy in tuberculosis is set forth. Part III deals with diseases of the hæmatopoietic system and of the kidney, and Part IV, which is concerned with cardiovascular diseases, includes an account of the at present experimental surgical procedures designed to relieve hypertension. Part V comprises the diseases of the digestive tract and also those of metabolism and nutrition. Here the increasing usefulness of gastroscopy as an aid to diagnosis will be noted. The book is adequately indexed and profusely illustrated with skiagrams, graphs, and microphotographs. As might be expected, the editorial comments which are appended to many of the articles are sound and well balanced. The series to which this book belongs has in a few years won an established place among annual publications.

The Microscope

Theory and Practice. By CONRAD BECK, C.B.E. London: R. and J. Beck. 1938. Pp. 264. 7*s*. 6*d*.

A MICROSCOPICAL image may be misleading if the principles on which the instrument functions are not understood. This book has been written to elucidate these principles, and to provide such instructions as may be needed for the mastery of the technique of microscopy. It is a particularly successful production. The account of optical theory is so clear that anyone who takes the trouble to read it will also understand it, while the practical instructions are concise and informative. The book is obviously written by one with an intimate knowledge of the optical and mechanical construction of a microscope as well as an appreciation of its many applications. It would be difficult to find elsewhere so much practical instruction within the same compass. Mr. Beck has drawn on his long experience of the pitfalls that await the uninitiated with the result that most if not all the possible errors of manipulation are noted. The mechanical construction of a microscope is described in sufficient detail, mainly in reference to the productions of Messrs. R. and J. Beck. This book is actually a new edition of the author's two previous books on the subject. It has gained by the elimination of some unnecessary matter.

THE LANCET

LONDON: SATURDAY, MARCH 26, 1938

TREATMENT OF THE MALARIAS

THERE is still much confusion of thought about the treatment of malaria, which will only be cleared up when it is realised not only by the expert but by governments, doctors, and peoples that there is not one malaria but several malarias. A study of synthetic drugs, as compared with quinine, in therapeusis and prophylaxis forms the substance of the fourth general report of the Malaria Commission of the League of Nations.[1] A section of the report is devoted to attempts in Rumania, U.S.S.R., and elsewhere to eradicate malaria from a locality, and the disappointing conclusion is reached that this cannot be achieved by drugs alone. Only by using all known anti-malarial means—especially measures directed against the vector insect and against the larvæ—can there be any great hope of attaining a goal which is in any case difficult to reach. The malariologist's programme should be a more modest one: to safeguard the populations of endemic regions, or the communities which have to live and work there, from severe and fatal infections, epidemic outbreaks, repeated reinfection, chronic malarial manifestations, and the social and economic consequences of endemic conditions. Whether the measures adopted to this end are drugs or an anti-mosquito campaign, or a combination of both methods, will depend on the local circumstances, the density of the population, and the economic factors involved.

An important preliminary is to ascertain the different drugs and doses most effective against the different species and strains of plasmodia and the sexual and asexual cycles of the same species, and the report gives definite guidance for doing this. For purposes of comparison the mean daily adult dose of quinine hydrochloride is taken as 1 gramme, of Atebrin as 0·3 gramme, and of Plasmoquine as 0·01 gramme. The reaction of trophozoites to quinine, given daily for 5 to 7 days in primary infections with *Plasmodium vivax*, is seen in their disappearance from the circulating blood till the first relapse comes on, as it does in about half the infected; the same reaction usually holds for *P. malariæ*; for *P. falciparum* the process is slower by about a day and the daily dose needed to effect clearance of the blood may have to be raised to 1·3 g. or 2 g. The action of atebrin on the trophozoites of tertian and quartan malaria is similar to but rather more rapid than that of quinine, and relapse is delayed for rather longer; on those of subtertian malaria this advantage may or may not show itself. The effect of plasmoquine on the trophozoites of *P. falciparum* is almost nothing, on those of *P. vivax* it is evident, while on those of *P. malariæ* it is rather greater. Turning to gametocytes and pregametocytes, quinine and atebrin are deadly to those of the last two species, but they have little effect on crescents though they interfere with their production; on the other hand plasmoquine devitalises gametocytes of all three species and lessens their numbers. For the clinician dealing with an acute malarial attack plasmoquine thus has no direct interest; but it will be in his mind as a means of preventing relapses. When given with or after quinine or atebrin it has a definite action in preventing relapses in infection with *P. malariæ* and in those with most strains of *P. vivax*, though its effect on *P. falciparum* seems less certain. In the armamentarium of the administrator concerned with public health plasmoquine has evidently won an established place.

That treatment for malaria may have ill effects of various kinds has not been forgotten in this survey. The conclusion reached by the Commission is that a strictly limited course of quinine is neither depressive nor toxic, nor does it interfere with the course of immunisation; about atebrin too little is known for opinion to be definite; a short course of plasmoquine in doses up to 0·2 g. is not seriously depressing. The advocacy of these short courses of treatment starts from the assumption that in practice drugs do not disinfest; their use should therefore be limited to keeping the infection under till the body has effected the final cure. This limitation avoids poisoning the host, and leaves him with a degree of infection which, under supervision, should help him to strengthen his resistance to existing and further infections. Since disinfestation is the patient's business, in which the physician's only share at present is the negative one of avoiding any intervention that might hinder him from getting on with it, it is essential that we should try to learn more about the details of the mechanism of immunisation. The considerable work of WILLIAM H. TALIAFERRO and PAUL R. CANNON[2] points to the macrophage of the reticulo-endothelial system as the agent active in the production in Panamanian monkeys of immunity to *P. brasilianum*; but the matter cannot be quite as simple as that, for S. P. JAMES and P. TATE[3] have directed attention to the fact that certain plasmodia of birds have adapted themselves to undergo a schizogonic cycle in the cells of that very system.

The main conclusion to which this report leads is that adequate treatment and accurate prognosis of a malarial attack must be based on knowledge of the species of parasite concerned and on some understanding of its local strain. No generalised advice can be offered to the clinician until the pathologist is able to give him a lead to the conditions in which the human body will best build up an immunity to present and future plasmodial infections.

[1] *Bull. Hlth Org. L.o.N.* 1937, **6**, 896.

[2] *J. infect. Dis.* 1936, **59**, 72.

[3] *Trans. R. Soc. trop. Med. Hyg.* 1937, **31**, 4; cf. *Lancet*, 1937, **2**, 1027.

REASON AND THE ROD

As a penalty inflicted by judges and magistrates, corporal punishment must go. Such is the unanimous opinion of a departmental committee of men and women who have reviewed the matter with patience and without preconceived opinions. The retributive aspect of a *lex talionis* meeting violence with violence is dismissed as a social anachronism. While the committee makes an exception for violence by the inmates of prisons, the birch and the cat-o'-nine-tails are deemed useless as reformative influences and inadequate as special deterrents. Flogging, abandoned by almost all other civilised countries, remains with us as a penalty additional to imprisonment or penal servitude; it is not essential, in the committee's opinion, to retain it for its supposed effect as an additional terror. A prison governor gave evidence of two cases where he had spoken to men who had been flogged for armed robbery. "Next time," said one, "I shall take care not to carry a gun." "Next time," said the other, "I shall take care to use my gun." Neither, be it noted, had any idea of abandoning robbery altogether. Even those who emphasise the deterrent value of corporal punishment claim only that it deters from those special offences for which flogging may be inflicted. Contrary to widely accepted tradition, experts say that the introduction of the lash by the Garrotters Act of 1863 was not the cause of stamping out the prevalent epidemic of brutal crime. By the time the Bill reached the House of Commons the outbreak of garrotting had already subsided. It is untrue that flogging is so efficacious that nobody is ever flogged a second time. Other historic extensions of the use of the lash by panic legislation have been largely retributive. Corporal punishment for sexual perversion or indecent exposure is more likely to be detrimental than remedial. Whatever the offence, this punishment is uncertain and, if the word may be permitted, unfair. It cannot be imposed unless the offender is passed as medically fit to undergo it. As for juvenile delinquents, a brief medical examination may normally suffice to determine the boy's physical fitness for the birch. His psychological and temperamental capacity is much more difficult to assess. The committee had evidence that the usual medical examination had not always prevented the birching of boys suffering from certifiable mental defect. The justices in a juvenile court have not the advantage of that prolonged examination of the boy's case which would equip them with full knowledge of his character and temper, his previous history, and his home life. Corporal punishment should follow closely on the finding of guilt, yet it should not be inflicted without the certainty that the boy is temperamentally suited for it. These two requirements of promptitude and deliberation are incompatible.

Let it not be thought that the committee have been dominated by advanced psychological ideologies. They are aware of the theory that the impulse to impose a sentence of corporal punishment is a perverted expression of the community's hatred of one who breaks its laws. They observe that the full implications of this idea would affect many other forms of punishment. They do not regard all corporal punishment as wrong. They say that the rigours of judicial flogging have often been exaggerated by opponents of the lash. While they deprecate the birching of juvenile delinquents, they find much to be said for a short sharp punishment which pulls a boy up for some act of naughtiness. They doubt if the juvenile court is well enough equipped for dealing effectively with offences which arise from a misguided spirit of adventure. They see no harm in vigorous correction of a domestic kind. They distinguish the corporal punishment inflicted by an unknown official after magisterial sentence from the possibly beneficent equivalent in the home and in the school. The father and the schoolmaster stand in personal relation to the young offender. They will continue to supervise him thereafter. These are definite advantages. In his home the boy realises, or at any rate is probably told, that he is being punished for his good; in the school he appreciates that punishment is part of the accepted discipline. The judicially imposed penalty may easily seem an arbitrary and impersonal infliction of physical pain. Several of the chief constables told the committee that they would prefer the birching to be administered by the schoolmaster or the probation officer rather than by the policeman. However these things may be, the committee's report is a valuable reminder that the merit of modern punishment must be its remedial and reformative effect. Stated without fanaticism or intolerance, its conclusion that the lash and the birch have outlived their day will convince. The recent sentences of the cat in what was known as the Mayfair case were greeted at first with no small measure of public satisfaction. They have now been inflicted and the men concerned are undergoing the accompanying sentences of incarceration. Will the cat have had a remedial effect upon them by the time they leave the prison gates? And is the community proud of its morbid interest in the details of the flogging?

The committee has proved its case so reasonably that the recommended retention of corporal punishment for violent prisoners is almost surprising. The atmosphere of our prisons has been humanised, the archaic severity of punishment has been mitigated, and statistics show that the flogging of a violent prisoner does not always deter him from future violence. Nevertheless the committee prefer that the power to inflict the lash or the birch should be retained as an ultimate sanction to punish the three serious offences of mutiny, incitement to mutiny, and gross assaults upon warders. The report mentions incidentally that, while birching is probably quite as painful as the cat, a prisoner who has been birched tends to be laughed at by his fellows as having received only a boy's punishment, whereas one who has had the cat is apt to be looked up to as a hero. This might suggest that the birch would be the better instrument to retain. It seems however

that the prison inmate has more fear of the cat. As corporal punishment is to be preserved for the protection of officers who are usually unarmed and for its deterrent effect upon men who are unimpressed by the reformative influence of methods less sharp, the committee recommend that both birch and cat be left available. Other minor recommendations are that the maximum number of 24 strokes be reduced to 18, that an end be put to the queer anomaly whereby a prisoner serving without hard labour can be flogged if his sentence was for felony but not if it was for misdemeanour, that the English and Scottish conditions be assimilated, and that the half-crown award now bestowed on the officer who inflicts the punishment be discontinued. For Borstal institutions in England the committee wishes to abolish the birch. There has never been any power to birch a Borstal boy in Scotland. The rod is not wanted for Borstal discipline; it has almost gone out of use; and exceptional cases can be dealt with by transfer to more rigorous surroundings. It was the general view of visiting justices and boards of visitors that the birch should be kept for these exceptional cases. On the other hand, five of the seven Borstal governors were for abolition. The departmental committee has listened to the governors rather than to the visitors. It may be some time before the Home Office secures statutory realisation of its committee's proposals. The House of Lords has sometimes been an obstinate champion of the sterner traditions of correction.

CHEMOTHERAPY OF MENINGITIS

INVOLVEMENT of the meninges is perhaps the gravest complication which can occur in a bacterial infection, and offers a severe test to any method of treatment. Thus, although the efficacy of serum treatment in some types of pneumonia is now beyond question, there is little evidence that meningitis due to these types of pneumococcus will respond to it. It is therefore highly significant that streptococcal meningitis has been found to share the susceptibility of other forms of streptococcal infection to treatment with Prontosil and sulphanilamide. The uses of this treatment were referred to by T. CAWTHORNE in our issue of Feb. 4th (p. 304) and other reports have recently appeared which are uniformly favourable, although the time has not yet come when results can be collected in large numbers. C. G. FLAKE and B. W. CAREY,[1] for example, treated six cases of otitis media in children, four of which were complicated by meningitis and one by septicæmia; all recovered. J. B. NEAL and E. APPELBAUM[2] used sulphanilamide in the treatment of streptococcal meningitis with results which seemed to them "quite astounding"; thirteen of their seventeen cases recovered. Here again, as would be expected, the majority were in children and due to otitis media. Recovery in such cases has hitherto been most exceptional, and on that account these results are perhaps even more impressive than those obtainable in other varieties of streptococcal infection such as erysipelas and puerperal fever.

The advent of this treatment has also improved the outlook in meningitis due to the meningococcus. The original experiments by BUTTLE, GRAY, and STEPHENSON, and by P. PROOM, in which it was shown that this organism is susceptible to the action of sulphanilamide were reported in this journal,[3] and such reports as have appeared of consequent clinical trials are favourable, although these are so far fewer and less extensive than might have been hoped. F. F. SCHWENTKER, S. GELMAN, and P. H. LONG[4] treated ten cases with only one death, the method of administration being the intrathecal and subcutaneous injection of a 0·8 per cent. solution of sulphanilamide in saline. Dr. A. ELDAHL of Copenhagen, who describes his results on p. 712, has treated twelve cases with nine recoveries; since most of these were infants, in whom the mortality is usually high, these are favourable results. In neither of these two series of cases was any serum given. Antimeningococcal serum is a far from perfect remedy, but those who are reluctant to omit any form of treatment which might possibly be of help will doubtless continue to give serum in addition to chemotherapy, and they have the support of T. M. BROWN,[5] who finds this combined treatment experimentally more effective than either alone.

It cannot be said that an optimum scheme of chemotherapeutic dosage has yet been defined, and a good deal of variation in method will be found in the papers quoted. Further trials should be guided by the following principles. It appears that sulphanilamide itself is the most effective drug, although soluble prontosil may take its place if parenteral injection has to be carried out owing to vomiting or other difficulties connected with oral administration. Other sulphonamide compounds about the action of which less is known, particularly in connexion with the meningococcus, are as yet of correspondingly uncertain value. The aim in dosage should be to attain an adequate concentration in the blood as early as possible, and to maintain this by four-hourly repetition until improvement occurs. According to A. JAUERNECK and W. GUEFFROY[6] sulphanilamide reaches the cerebro-spinal fluid, though after varying intervals of time, in greater concentration when there is meningitis; their findings in its absence are in conflict with those of MARSHALL, EMERSON, and CUTTING,[7] who noted that the concentration attained in the cerebro-spinal fluid of the normal dog was about three-quarters of that in the blood. Some of the authors quoted emphatically recommend intrathecal administration, and others consider it unnecessary. Those who have used it maintain that the intrathecal injection of a 0·8 per cent. solution of sulphanilamide in saline is a harmless procedure, and since by this means an

[1] *New Engl. J. Med.* 1937, **217**, 1033.
[2] *Amer. J. med. Sci.* February, 1938, p. 175.
[3] *Lancet*, 1936, **1**, 1286; 1937, **1**, 16.
[4] *J. Amer. med. Ass.* 1937, **108**, 1407.
[5] *Bull. Johns Hopk. Hosp.* 1937, **61**, 272.
[6] *Klin. Wschr.* 1937, **16**, 1544.
[7] *J. Amer. med. Ass.* 1937, **108**, 953.

adequate concentration of the drug can certainly be attained at the site of the disease earlier at least by some hours than by any other means, it should be a valuable measure at the outset, pending the effects of oral administration. Further studies of the rapidity and extent of sulphanilamide secretion into the cerebro-spinal fluid seem to be required.

HÆMORRHAGE, JAUNDICE, AND VITAMIN K

ACCORDING to the theory of blood coagulation most widely held at the present time, a ferment-like substance prothrombin is converted into thrombin in the presence of calcium and tissue derivatives. The thrombin then reacts with the fibrinogen of the plasma to produce fibrin.[1] There is no simple selective method for the estimation of prothrombin and the technique described on another page by DAM and GLAVIND, like most of its predecessors, measures the time not only for the conversion of prothrombin into thrombin but also for the reaction of thrombin with fibrinogen. The test devised by DAM and GLAVIND nevertheless agrees with that of QUICK and his co-workers[2] in giving normal values in hæmophilia and much reduced values in spontaneous jaundice in man. The level of prothrombin falls in the plasma of animals with a complete biliary fistula and therefore one factor for its maintenance is the presence of bile in the bowel.[3] But obstruction to the outflow of bile is not the only explanation of the hæmorrhagic tendency of jaundice, for it occurs also in chloroform poisoning and in animals who are fed on toxic sweet clover hay, suggesting that the liver is actively concerned in the manufacture of prothrombin and that toxic factors can deplete the supply.[4]

A rational explanation for the hæmorrhagic tendency of jaundice and a method apparently satisfactory for its treatment are now available as a result of the experimental work of DAM and his collaborators. For some years they have been studying a hæmorrhagic state which develops in certain birds when they are fed on a defective diet and is associated with a deficiency of prothrombin in the plasma. Hæmorrhagic chick disease is characterised by a pronounced tendency to hæmorrhage and a reduced clotting power of the blood, and it appears to be due to the absence of a fat-soluble food constituent which has been called the *Koagulationsvitamin* or vitamin K. This vitamin is especially abundant in hog-liver fat and in green leaves; it can be prepared in the form of strong concentrates, the intramuscular or intravenous injection of which, in jaundice, brings back to normal the coagulating power of the blood. It would therefore appear that the absorption of the fat-soluble vitamin K is decreased in jaundice as a result of the steatorrhœa and the hæmorrhagic tendency may be regarded as a conditioned deficiency. Direct deficiency of vitamin K can be produced only with difficulty, if at all, in mammals.

[1] Eagle, H., *Medicine, Baltimore*, 1937, **16**, 95.
[2] Quick, A. J., Stanley-Brown, M., and Bancroft, F. W., *Amer. J. med. Sci.* 1935, **190**, 501.
[3] Hawkins, W. B., Brinkhous, K. M., *J. exp. Med.* 1936, **63**, 795.
[4] Roderick, L. M., *Amer. J. Physiol.* 1931, **96**, 413.

DAM's work is confirmed in a symposium of papers from the Mayo Clinic[5] and the various studies made suggest that bleeding in jaundice occurs when the level of prothrombin reaches as low a point as 20 per cent. of the normal amount. This point is a critical one; the transition from apparent normality to a hæmorrhagic state may be abrupt and may follow quite a small operative blood loss, owing to the body's inability to regenerate prothrombin in the absence of vitamin K. The vitamin is ineffective by mouth in jaundice, unless bile is administered at the same time; otherwise it is not absorbed. The combination of vitamin K and human bile or animal bile salts has been used with apparent success in eighteen patients with obstructive jaundice. ALMQUIST[6] in California has now obtained the anti-hæmorrhagic substance in the form of a colourless crystalline fraction and has demonstrated that it contains the benzene ring. Surgeons need anticipate no great delay before the formula is known and pure preparations are available for parenteral use.

NEW FELLOWS OF THE ROYAL SOCIETY

THE endorsement by the Royal Society of the recommendations made by its council for election to the fellowship has this year been advanced from May to March, and the official list of names is set out on another page. Whereas last year only one medical man received this coveted honour, this year we have to welcome three members of our profession as well as others whose work is directly concerned with medical problems. C. H. BEST was associated with BANTING in the discovery of insulin and has not only contributed largely to our knowledge of its effects but has also helped to devise methods for its large-scale production. Recently his work has thrown light on the rôle of choline in the metabolism of fat and carbohydrates. W. E. GYE was led by his work on the defence rupture mechanism after the war to productive experimental study of the pathology of silicosis. Since 1925 he has concentrated attention on the problems of malignancy and his studies of the agency of viruses in the ætiology of new growths have given a fresh stimulus to the study of cancer throughout the world. H. H. WOOLLARD has done distinguished work especially in neuroanatomy. His recent contributions of clinical interest have been in the distribution of the sensory endings in the human skin, on tests for visual perception, and on the lymphatic system as revealed by opaque injections. Of the scientists doing work with a direct bearing on medicine, J. W. COOK has discovered the relation between the chemical structure and the carcinogenic activity of certain complex hydrocarbons and has contributed to our knowledge of the structure and properties of sex hormones. EDGAR STEDMAN has explored the relation between chemical constitution and physiological action in alkaloids of the urethane group.

[5] *Proc. Mayo Clin.* Feb. 2nd, 1938.
[6] Almquist, H. J., *J. biol. Chem.* 1937, **120**, 635.

ANNOTATIONS

COMMISSIONS IN THE R.A.M.C.

WE learn that the supply of medical officers for the regular army is now being maintained at a rate which should soon make up the shortage experienced for some years after the war. Since 1934, when the recommendations of the Warren Fisher Committee were adopted, 195 short-service commissions have been given. Of this number 182 qualified in home medical schools and 13 in the Dominions. Resident civil hospital appointments were held by 152 officers before or after receiving a commission. This high proportion is the result of seconding young officers to complete or to take up house appointments after being gazetted into the Royal Army Medical Corps. Since 1935 junior officers with special qualifications or who have experience beyond the average in particular branches of medicine may be "graded" for special employment in the subject of their choice and while so employed receive additional pay. Up to date 49 have been graded as follows: surgeons 19, anæsthetists 10, gynæcologists 6, physicians 5, pathologists 3, otologists 2, ophthalmologists 2, dermatologists 2. The next entry for the corps takes place on May 1st.

SIX YEARS WASTED

THE appointment of the Interdepartmental Committee on the Nursing Services has led to a revival of interest in the final report of THE LANCET Commission on Nursing. Now that many bodies deeply concerned at the shortage are preparing evidence for submission to the committee we receive almost daily tributes, direct and indirect, to the wisdom of the proposals made therein. The consensus of opinion is that if these had been more generally implemented the supply of candidates would by now have been adequate to the increasing need. This view was set out with cogency and precision in a contemporary [1] last week.

"The standard work on reform of the nursing profession is THE LANCET Commission's report (1932), a work of such excellence that though it is somewhat old it will never become obsolete. Had THE LANCET recommendations been adopted in full, the nursing profession would have been placed on a basis from which it would have developed automatically and the necessity for the Interdepartmental Committee would not have arisen. The College of Nursing memorandum * says: 'The recommendations put forward by THE LANCET Commission became unnecessary as the position was remedied automatically by the economic world crisis.' We are inclined to put this somewhat differently by saying that the crisis in relieving by force of circumstance the acute shortage of nurses which led to THE LANCET Commission, gave a temporary excuse for not accepting its recommendations. The crisis fortunately has passed and the troubles of the nursing profession have returned and some permanent settlement of them is now imperative."

Our contemporary proceeds to comment on the training of a health visitor and to protest against one of the suggestions made by the College of Nursing in their evidence—that the health visitor's two years' training might be taken as a pre-nursing course to fill the gap between school and hospital. Medical officers of health give good reasons for objecting to this sequence of professional education. They contend that the special kind of training required by the health visitor cannot be appreciated by those without considerable experience of life and would only be confusing to a young girl who knows nothing of the social troubles of humanity and how to react to them. It would indeed be small gain if the gap were filled at the expense of the balanced outlook which is more essential than ever before in those who go into the homes of the people to teach them the art of healthy living.

[1] *Med. Offr.*, March 19th, 1938, p. 116.

* Memorandum relating to conditions in the nursing profession for submission to the Interdepartmental Committee on the Nursing Services. 1938. Pp. 43. 1s. 6d. (Obtainable from the Secretary of the College, 1a, Henrietta-street, London, W.1.)

FIBIGER'S TUMOUR OF THE RAT'S STOMACH

THE significance of Fibiger's contribution to the cancer problem [1] is generally held to lie in his demonstration of an extraneous cause, the parasitic worm *Gongylonema neoplasticum*, in the stomachs of rats affected with gastric cancer, and in the provision of an experimental method for reproducing this lesion by feeding rats with that parasite. The history of his discovery and the difficulties which he met with and overcame are related by Hadfield and Garrod [2] who describe it as one of the most extraordinary stories in the whole of pathology. Another chapter in this story has lately been added by Cramer.[3] From it we realise that the mystery deepens while the interest it evokes becomes in some ways greater, in others less. It is less because doubt has arisen whether Fibiger's tumours were in fact malignant carcinomata. The question was first raised by Bullock and Rohdenburg [4] and more recently by Passey [5] and, as Cramer points out, the only conclusive evidence to be found in support of malignant change refers to one mouse from which Fibiger succeeded in transplanting one of his alleged carcinomata through four generations. The lesions in the lungs described as metastases may very well have been squamous metaplasia of bronchial mucosa due, as Passey, Leese, and Knox [6] have pointed out, to a diet deficient in vitamin A. Fibiger repeatedly stated in his writings that his animals were kept on a diet composed exclusively of white bread and water. This would have contained little or no vitamin A and a subsidiary problem, which Cramer discusses, is how these rats managed to live long enough to get the lesion. In interpreting Fibiger's accounts of the tumours, however, it has to be remembered that he clearly described two distinctive conditions, a benign hyperplasia and a malignant type of growth, and that he was an experienced observer. It might then seem to be a simple matter to settle this doubt by repeating Fibiger's experiments. It appears that no one has attempted this with mice, and that Passey has been unable to obtain any but benign lesions in rats, although he fed his animals with the *Gongylonema neoplasticum* in combination with a diet of white bread and water, and with a vitamin-A deficient diet. Even so the benign lesions he obtained were slight and not

[1] Fibiger, J., *Z. Krebsforsch.* 1913, **13**, 217; 1914, **14**, 295; 1920, **17**, 1.

[2] Hadfield, G., and Garrod, L. P., Recent Advances in Pathology, London, 1934, p. 55.

[3] Cramer, W., *Amer. J. Cancer*, 1937, **31**, 537.

[4] Bullock, F. D., and Rohdenburg, G. L., *J. Cancer Res.* 1918, **3**, 227.

[5] Passey, R. D., Annual Report of the Yorkshire Council of British Empire Cancer Campaign, 1934, p. 9; 1935, p. 8.

[6] Passey, R. D., Leese, A., and Knox, J. C., *J. Path. Bact.* 1936, **42**, 425.

comparable with Fibiger's or Cramer's benign hyperplasia.

The added interest arises from Cramer's own experiences. Various claims had been made that extensive benign hyperplasia and even carcinomata could be produced in the rat's fore-stomach by dietetic deficiencies alone. In 1927 Cramer sought to test these claims and though he was able to obtain all degrees from a few papillomata to extensive hyperplasia filling the whole fore-stomach he found that they occurred in rats deficient in vitamin A, in others partially deficient in vitamin B, in others on an abnormal salt diet, in stock rats which had never suffered any known deficiency and also in rats fed on kitchen scraps. Of the lesions he got at that time he has complete histological and photographic records. Although extensive hyperplasias were often seen, no malignant lesion was ever obtained. Ten years later the investigation was restarted in order to find out if by superimposing a carcinogenic substance on a benign hyperplasia due to the dietetic deficiency, malignant change could be induced. On this occasion, however, the same diets, that is to say synthetic diets deficient in vitamin A or B, which had previously produced papillomatosis, failed completely to induce this condition. All other diets alleged to produce papillomatous hyperplasia also failed, and no example of the lesion was found among untreated stock rats. Thus any progress in elucidating this problem appears at the present time to be obstructed because neither condition described by Fibiger can be produced at will.

For two good reasons, to which Cramer draws attention, all the discrepancies which he relates require publicity among laboratory workers. In the first place they must be taken into account in experiments designed to test the carcinogenic action of substances, especially those in food and drink. Simultaneous control observations of normal stock are shown to be indispensable. In the second place it now appears that some unknown factor may be the determining one in the onset of benign and malignant hyperplasia of the rat's stomach, while both *Gongylonema neoplasticum* and dietetic measures may be merely contributory. If this is so it is a possibility that the cause of either or both lesions is a virus similar to that responsible for the infective papilloma of the skin of rabbits. The appearance at one time and disappearance at another under apparently similar conditions offers a pointer in that direction for the next observer who comes across this lesion.

J. NEUROPHYSIOL.

A NEW scientific periodical, the *Journal of Neurophysiology*, was launched from Yale University last January. The editors are J. G. Dusser de Barenne and J. F. Fulton (Yale) and R. W. Gerard (Chicago) acting with an advisory board of 25 distinguished neurophysiologists drawn from both sides of the Atlantic, including Prof. E. R. Adrian and Sir Charles Sherrington in this country and Dr. J. C. Eccles in Sydney. An editorial memorandum states that the primary aim of the journal is "to provide a channel for *prompt* publication of original work bearing on the functions of the nervous system, peripheral and central. It has been planned to embrace all aspects of the subject amenable to experimental analysis; it will not include morphology for its own sake nor neuropathology, and only those clinical, psychological, or zoological contributions will be considered which are primarily experimental in character." The editors point out, and most will agree with them, that, apart from the claims of neurophysiology to independent recognition, there is an urgent practical need for a new channel of publication. It is indeed true that many neurophysiologists at present find their outlet for publication in journals such as *Brain* in this country and the *Archives of Neurology and Psychiatry* in America, but these already have to meet the heavy claims of neuropathology and clinical neurology. This new journal, then, fills a need and may indeed, as the editors hope, serve not only to concentrate divergent experimental investigations on the nervous system but also to relieve congestion in neurological publications of more general scope.

The first number includes nine papers on subjects ranging from the potassium content of nerves as affected by stimulation, to electrical studies of nervous tissue and ablation experiments in cats and monkeys. The journal is of standard form, printed upon glossy paper which permits the inclusion of photographs and line drawings in the text. An auspicious start has been made, and support for the venture will doubtless be forthcoming from this country, which has supplied many brilliant workers in this particular field.

CARDIAC FAILURE

WHY does the patient with old-standing symptomless aortic regurgitation suddenly develop failure symptoms, when it is known that the valvular lesion has undergone no change for many years? This is the poser put to the February meeting of the Liverpool Medical Institution by Dr. G. R. Ellis. His own view is that changes in the myocardium rarely provide a satisfactory explanation except where massive infarction or some such lesion has occurred, and that the answer probably lies in some metabolic change in the myocardium, akin to fatigue in skeletal muscle. This concept is one which should stimulate research in the next few years. Work on the biochemical aspect of cardiac failure was and is held up by the lack of knowledge of what happens to the metabolism of a muscle when it becomes fatigued. The Starling heart-lung preparation has shown that as the heart fails its mechanical efficiency decreases, so that in order to maintain the same output more energy must be expended. Most modern theories of the cause of cardiac failure suggest the importance of a diminished utilisation of oxygen in the metabolism of the failing muscle. Fishberg,[1] in the book reviewed elsewhere in this issue, summarises the reasons for believing that even in the absence of coronary disease there may be a deficient supply of oxygen to the muscle of the hypertrophied heart. The occasional failure of the heart in cases of severe anæmia may be due directly to the diminished supply of oxygen, since the failure disappears with the cure of the anæmia. It has been suggested that angina pectoris may have the same causation, in which case it will have to be explained why angina does not occur more commonly in cardiac failure.

From time to time chemical changes thought to be associated with fatigue in skeletal muscle have also been shown in failing heart muscle. Redfield in 1926 showed that the ability of the ventricular muscle of the turtle to develop tension is closely correlated with its content of lactic acid, so that the more lactic acid present the less tension can be developed. Harrison[2] found that in skeletal muscles overwork was associated with a decrease in the potassium content and has shown that in the muscle

[1] Fishberg, A. M., Heart Failure, London, 1937.
[2] Harrison, Pilcher, and Ewing, *J. clin. Invest.* 1930, **8**, 325.

of the failing heart the potassium content is also low. A large portion of the energy for contraction of skeletal muscle is derived from the breakdown of creatine-phosphate, and G. Herrmann [3] has produced evidence that the creatine content is less than normal in muscle taken from human cases of heart failure and has found similar results in experimental animals. It is suggested that these changes are due to diminished oxidation, but practically nothing is known of their intimate nature.

Of the general metabolic disorders causing cardiac failure, myxœdema, hyperthyroidism, and beri-beri seem most suitable for study. Cardiac failure is rare in myxœdema, possibly because the lowered metabolism decreases the work of the heart, and when it does occur pre-senile coronary disease is said to be present. In hyperthyroidism the work of the heart at rest is increased and the position is analogous to that in valvular disease, with the added factor that the thyroid may stimulate increased metabolism in the heart muscle itself. It may be that in beri-beri an altered metabolism of the heart muscle is responsible for the onset of cardiac failure. Human subjects and rats on a diet deficient in vitamin B_1 have developed cardiac failure and changes in the electrocardiogram which could be restored to normal by adding vitamin B_1 to the diet. Wenckebach [4] suggested that œdema of the heart muscle was the cause of its failure, but such œdema is not invariably present in beri-beri, and the B_1 deficiency may act by depressing some oxydase system in the metabolism of cardiac muscle. The beri-beri heart is well worthy of further study because it appears to present an instance of cardiac failure in the absence of mechanical factors and its cause and cure are known.

VALUE OF A CORNEO-SCLERAL SUTURE IN CATARACT EXTRACTION

DAMAGE to the eye during operations for cataract through failure of coöperation on the part of the patient or his misbehaviour during operation is one of the most distressing of avoidable accidents, and most recent advances in the surgery of cataract extraction have been concerned with measures for preventing such mishaps. Akinesia of the orbicularis oculi, retro-ocular anæsthesia, a speculum that does not press or weigh upon the eye, and a superior rectus stitch are among the more important of these technical additions to the classical operation. Although many surgeons in different countries have used some method of suturing either the conjunctival flap or the cornea and sclera in cataract extraction, the value of a corneo-scleral stitch has not been widely appreciated by ophthalmologists. H. B. Stallard [5] in a series of 95 cases of cataract extraction (72 extra- and 23 intra-capsular) has shown that a corneo-scleral suture properly applied is an important factor in the prevention of post-operative hyphæma. Before he used this stitch 30–35 per cent. of his patients at Moorfields developed post-operative hyphæma of varying degree, but since he made it part of his routine this complication has not occurred once in the series of 95 consecutive and unselected cases. Other advantages it brings include a measure of safety in allowing elderly patients out of bed on the day after operation; a reduction of the liability to iris prolapse; and a means of checking vitreous loss, conjunctival sutures being quite useless when this disaster occurs. B. Graves [6] has pointed out that the eyeball may be fixed by holding the scleral ends of the suture in plane forceps, a technical point of some value when the fixation forceps tear through a thin degenerative, senile conjunctiva. Stallard has devised for the insertion of this stitch a small eyeless curved needle 11 mm. long, with a cutting spine on the convex aspect of the needle; this needle seems to have definite advantages over the Maddox needles hitherto used for this purpose, for they not only have a spine on the concave aspect of the needle shaft and are thus liable to cut out of the cornea, but also an eye which means that a double piece of fine silk has to be dragged through the tissues.

[3] Herrmann, Decherd, and Schwab, *Sth. med. J., Nashville*, 1936, **29**, 386.
[4] Alsmeer and Wenckebach, *Wien. Arch. inn. Med.* 1929, **16**, 193.
[5] *Post-Grad. med. J.* February, 1938, p. 49.

WAVE-LENGTH AS A FACTOR IN RADIOTHERAPY

AT a time when large sums are being spent on the purchase of radium and on the building of high voltage X ray therapy apparatus, it is opportune to ask whether a real gain in efficiency results from using rays of shorter wave-length. The question is discussed by Mr. G. F. Stebbing,[7] who points out that the major advantages which may be expected are greater penetrating power and a more selective action. The penetrating power of short-wave radiation is a physical fact and it is clear that increase of penetration must give a better dose at a depth in proportion to the dose received at the skin, but that short waves have a selective action is not yet accepted as a biological fact. Mr. Stebbing holds the view that gamma rays show clinically a selective effect which is not a property of wave-lengths in the ordinary X ray therapy range. Particularly in the treatment of malignant diseases in the posterior part of the oral cavity and in the pharynx he has found them more destructive to the tumour and less injurious to the surrounding normal tissues. On the other hand, in Mr. Stebbing's experience, short waves have an unfortunate selective effect on the blood-cells, and the treatment of large masses with penetrating radiation requires extreme care because of the risk of a dangerous leucopenia. His plea for further research on these controversial points will be endorsed by all who have the heavy responsibility of determining the type of radiation most appropriate to individual malignant lesions.

THE WEIL-FELIX REACTION AND PROTEUS BACILLI

WHY is it that, in contrast to human beings, monkeys, dogs, cats, and rats, the guinea-pig when infected with typhus virus does not give a positive Weil-Felix reaction? This is the question asked by P. Giroud and S. Tannenbaum,[8] who attempt to provide an answer to it. They believe that the guinea-pig is peculiar in that it contains no proteus bacilli in its intestine. Frequent observations entirely failed to reveal the presence of these organisms in either the blood or the fæces. Attempts were therefore made to implant it in the intestine, and to study the result in terms of the development of agglutinins to proteus X. One group of guinea-pigs was infected with typhus virus; their blood, as was to be expected, remained persistently free from agglutinins to proteus (O)XI9, (O)X2, (O)XK, and (O)XL. Another group received a strain of *Bact. coli* by the mouth and by the rectum over a period of 23 days; these animals

[6] *Brit. med. J.* 1937, **2**, 319.
[7] *Brit. J. Rad.* March, 1937, p. 177.
[8] *Arch. Inst. Pasteur, Tunis*, 1937, **26**, 671.

did not develop a Weil-Felix reaction. A third group received a strain of proteus, labelled M, by the mouth and rectum for 23 days, and likewise remained negative. A fourth group, which had been given proteus, strain M, and had then been infected with typhus virus, developed agglutinins after two or three weeks to (O)X19 and (O)XL in a titre varying from 1/25 to 1/1000, though not to (O)X2 or (O)XK; while another group that had been given proteus, strain Melun, by the mouth and had then been infected with typhus virus, agglutinated (O)XL, but not (O)X19, (O)X2, or (O)XK, to a titre of 1/100 or over. Not every animal in these last two groups reacted, but most of them did. Discussing these findings the authors conclude that a Weil-Felix reaction will not develop unless proteus bacilli are present in the intestine. Why it is that agglutinins develop to organisms of the proteus X group during the course of typhus fever is, however, not very clear. It is known that *Rickettsia prowazeki* and proteus X share a common antigen, and many workers have therefore assumed that the Weil-Felix reaction is due to the simple development of agglutinins to this antigen as the result of infection with the typhus virus. If this were so, it is difficult to understand why the serum of the guinea-pig, which develops protective antibodies to the typhus virus, should not agglutinate proteus X. It also leaves unexplained the finding that proteus X is not infrequently present in the urine or blood of typhus fever patients. Giroud and Tannenbaum, on the basis of their observations, believe that during the course of typhus fever proteus bacilli, which are normally harmless, become mildly pathogenic, invade the tissues, and give rise to agglutinins acting on one or other of the proteus X strains. They support this conclusion by referring to the occasional development in patients suffering from typhoid fever of agglutinins to *Bact. coli* or *Ps. pyocyanea*. If this explanation is true, it follows that unless proteus bacilli are present in the intestine, a Weil-Felix reaction cannot develop during the course of typhus fever. One of the difficulties in accepting it is in believing that proteus bacilli are never present in the intestine of the guinea-pig but are present uniformly in the intestine of man and several other animals which are susceptible to typhus fever. Is this really true? The question is crucial, and seems to call for a careful survey of the intestinal flora of mammals.

CHIROPODY HAS A JUBILEE

IT was in 1912 that the Society of Chiropodists was founded and three years later saw the young society established and incorporated. The regular annual convention, held in London last week, enlarged its scope to a jubilee celebration; the usual demonstrations at the London Foot Hospital were supplemented by several informative lectures, the exhibition of medical films, and visits to the Guildhall and the Apothecaries Hall. At the jubilee dinner on Saturday evening Mr. J. H. Hanby, who presided, was supported by the society's two founders, Mr. E. G. V. Runting and the veteran Dr. A. W. Oxford, about whom Dr. J. M. H. Macleod had something to say when proposing a toast: "I was walking up Regent-street in 1913 with Dr. Oxford when he remarked to me, 'I have got a new interest in life and I shall not be happy until the benefits of chiropody are brought within the reach of everyone.'" During this short walk Dr. Macleod was invited to give the inaugural lecture to the new society, and from this beginning arose the organisation which has become one of the ancillary services of medicine. The founders laid stress on the need both for training and for an ethical standard, with the result that the curriculum was now approved by the Conjoint Board and Dr. Macleod foresaw recognition being granted by the British Medical Association at its next annual meeting. Dr. Oxford then himself recited the story of the early struggles of the society and consoled its members and fellows for the non-appearance as yet of their names in the honours list by remarking that only two dentists had ever been knighted. He enjoined chiropodists to be loyal one to another and to hold together firmly. Mr. Runting also counselled his hearers, as he said he had often done before, to make themselves so skilled in their craft that the medical profession could do no other than hand over to them cases needing care of this kind. He lost no opportunity himself of emphasising the value of "straight" chiropody. And the harmony was rendered complete by Sir Cuthbert Wallace's reply to the toast of the medical profession. Medicine is, he said, a large family with many concerns and we are glad that chiropodists have joined the family party. There were nearly 300 people present at this banquet.

TRAFFIC IN DANGEROUS DRUGS

THE council of the League of Nations has invited Greece and Czechoslovakia to appoint representatives on the advisory committee on traffic in opium and other dangerous drugs. The retirement of Mr. Lyall (United Kingdom), who has for many years rendered valuable service to the committee as assessor, was regretted and the appointment of a successor was postponed. The council expressed gratification at learning from the Permanent Central Opium Board that compliance with the Limitation Convention of 1931 in regard to furnishing statistics of estimates of drugs required by the several governments was increasingly satisfactory. The completed returns for the year 1936 show that the total seizures of drugs in illicit traffic were of raw opium 142,840 kg., of morphine 513 kg., of heroin 1279 kg., and of cocaine 447 kg. The highest figures for morphine and heroin were from China and for cocaine from Japan. A seizure of 45 kg. of opium and 14 kg. of cocaine was reported from Canada, the drugs having been stolen from a warehouse in Montreal. The burglars had dug into a vault on the premises and, having possessed themselves of the narcotics, proceeded to peddle them in the underworld of Montreal. Some of the cocaine however was conveyed to New York and was there discovered by the police; a gang of seven traffickers was exposed and convicted.

THE SERVICES

COMMISSIONS IN THE R.A.M.C.

APPLICATIONS for commissions in the R.A.M.C. are invited by the War Office. Candidates who will be selected without competitive examination will be required to present themselves in London for physical examination and interview on or about April 22nd. They must be registered under the Medical Acts and (normally) not over 28. Successful candidates will, in the first instance, be given short-service commissions for five years. During the fourth year of this period they will have the opportunity of applying for permanent commissions in either the R.A.M.C. or the I.M.S. Those not selected will retire on completion of five years' service with a gratuity of £1000. Full particulars on application, either by letter or in person, to the assistant director-general, Army Medical Services, War Office, London, S.W.1.

SPECIAL ARTICLES

BOVINE PHTHISIS

ITS INCIDENCE IN NORTH-EAST SCOTLAND

COUNTY AND CITY CASES

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IN a previous article (1935) we reported the results of typing the tubercle bacilli in the sputum of 103 cases of pulmonary tuberculosis from the country districts of north-east Scotland. The proportion of bovine to human infections—namely, 13 bovine to 90 human—in this series was more than two and a half times as high as that found in the middle east and south of Scotland. Moreover, all the bovine cases were derived from the counties of Aberdeenshire, Banffshire, and Morayshire, giving for these counties the astonishingly high percentages of 15, 18, and 25 respectively. Since bovine cases are apt to appear irregularly in a series we thought that these high percentages might be in part fortuitous and due to chance grouping of cases which owed their origin to infections acquired in different years. We decided therefore to pursue our investigations over a longer period, and to extend them to the city of Aberdeen, in order to arrive at as close an approximation as possible to the true incidence of bovine pulmonary tuberculosis in this region.

The investigation of sputum from the counties was begun towards the end of April, 1934, and from the city of Aberdeen in February, 1935. The total number of cases from north-east Scotland examined down to September, 1937, is 636—342 from the counties and 294 from Aberdeen. Included in the figure 342 for the counties are the 103 cases previously reported and 5 cases from Caithness (1 due to bovine and 4 to human bacilli) examined in 1935 by Dr. W. T. Munro, who has kindly allowed us to include them in our series.

METHODS AND RESULTS

The microscopical examinations of sputum for tubercle bacilli for the whole of north-east Scotland, including the Orkney and Shetland Islands, are undertaken at the laboratory of the City Hospital, Aberdeen. During the periods covered by this inquiry all the positive specimens from the counties and city of Aberdeen have been sent to the Field Laboratories, Cambridge, where the tubercle bacilli were cultivated and typed by one of us (A. S. G.). The methods of isolating and typing the strains have been described in our previous report (1935). The total number of cases which have yielded cultures of tubercle bacilli is 636, in all of which, with one exception, the cultures were obtained directly from the sputum. In 4 cases the sputum though microscopically positive gave negative results in culture and repeat specimens from 2 were also negative.

It has been possible without any difficulty to classify all the strains in one or other of three groups—namely, eugonic human, dysgonic human, and dysgonic bovine.

From 570 cases the strains produced on egg, glycerin egg, and glycerinated potato the luxuriant growths of the eugonic human type of bacillus.

From 22 cases the strains, though growing well on egg, glycerin egg, and bovine serum with formation of pigment on the latter, were dysgonic on glycerinated potato and agar. The virulence of the strains was that of the eugonic human type of bacillus—namely, high for the guinea-pig and relatively low for the rabbit. These are the characteristics of the "dysgonic" variety of the human type.

From 44 cases the strains were dysgonic on all media and proved highly virulent for rabbits. These strains were indistinguishable from tubercle bacilli of bovine tuberculosis.

In this paper we deal fully only with the cases that yielded bovine tubercle bacilli.

TABLE I—REGIONAL DISTRIBUTION OF THE BOVINE CASES

County.	Cases.	Eugonic human.	Dysgonic human.	Bovine and per cent.
Aberdeenshire ..	139	116	11	12 (8·6)
Banffshire ..	69	60	1	8 (11·6)
Morayshire ..	40	35	..	5 (12·5)
Kincardineshire ..	25	25	..	..
Caithness	15	12	1	2 (13·3)
Sutherland ..	2	2	..	..
Invernessshire ..	2	2	..	..
Nairnshire ..	3	3	..	..
Orkneys	13	7	2	4 (30·8)
Shetlands	34	34	..	..
	342	296	15	31 (9·1)
City of Aberdeen ..	294	274	7	13 (4·4)
Total ..	636	570	22	44 (6·9)

THE BOVINE CASES

On account of the possibility of the sputum being contaminated with bovine tubercle bacilli from milk or milk products it is desirable when bovine bacilli are found in sputum to repeat the investigation with a fresh specimen from the patient. In this series we were able to investigate an additional specimen in each of 35 cases, and from 3 of these cases five (one, two, and two) further specimens were examined. The intervals between the first and last specimens from the different cases ranged from 7 to 168 days. In the remaining 9 cases a further specimen was unobtainable owing to the death of the patient before the type of bacillus had been ascertained. It may be mentioned that a request for a further specimen was made at once when on microscopical examination of the original sputum at Cambridge the appearances of the tubercle bacilli suggested that they might be bovine—that is to say, when the bacilli were mainly short and uniformly stained, or when the primary cultures plainly indicated that the bacilli were of the bovine type.

Thus the total number of strains obtained from the 44 bovine cases was 84, all of which were typically bovine in cultural characteristics, none showing any sign of the presence in them of a eugonic human element.

The virulence of the strains was tested on 105 rabbits, 47 strains from 37 cases by intravenous, and 48 strains from 39 cases by subcutaneous inoculation.

Fifty-two rabbits were injected intravenously with 0·01 mg. of culture or less (47 strains from 37 cases), the doses ranging down to a millionth

TABLE II—GIVING SEX, AGE, OCCUPATION, AND CHIEF CLINICAL PARTICULARS OF EACH BOVINE CASE

Case No.	Sex and age.	Occupation.	Previous glandular tuberculosis.	Clinical duration of pulmonary tuberculosis.	Distribution of tuberculosis.	Family history.
			COUNTY CASES			
S. 2 5.v.34	M., 23	Clerk.	Cervical adenitis at 9 yrs.	2½ yrs.	L. apex.	None.
S. 3 14.vi.34	F., 17	At home.	None.	A few mths.	R. middle lobe and hilum.	Mother cured.
C.S. 9 17.v.34	F., 24	Clerk.	None.	About 4½ yrs.	Bilateral apical, cavitation R.	Yes.*
C.S. 19 1.vi.34	F., 20	Occasional farm-worker.	Cervical adenitis at 7–8 yrs.	4 yrs.	Bilateral fibrotic.	None.
C.S. 26 23.vi.34	F., 27	Domestic worker.	Abdominal glandular at 20 yrs.	5 „	R. lung. No cavities.	None.
C.S. 28 23.vi.34	F., 39	Housewife.	None.	4 9/12 „	L. upper and middle lobes.	Yes.
C.S. 37 7.vii.34	F., 35	Housewife.	None.	1½ yrs. Died 26.vii.34.	Widespread in lungs, L. worst.	Husband.
C.S. 40 9.vii.34	F., 23	Seam-stress.	None.	3 mths.	L. apex.	None.
C.S. 45 19.vii.34	F., 31	Domestic worker.	None.	7 yrs.	Started L. apex, both lungs in 1933; larynx affected.	None.
C.S. 80 26.x.34	M., 36	Trawler fireman.	Neck gl. enlg. and scraped in childhood.	Not fixed, never robust. Died 29.xii.34.	L. lung.	Parents' relatives.
C.S. 94 6.xii.34	F., 21½	Domestic worker.	Cervical adenitis at 16 yrs.	Pleurisy a year ago.	L. apex chiefly.	None.
C.S. 102 4.i.35	M., 28	Grocer's assistant.	None.	6 mths.	Both lungs.	Father's brother.
C.S. 103 8.ii.35	F., 41	Housewife.	None.	9 yrs.	Bilateral.	None.
(Munro's) v.35	F., 65	On a croft.	(No information from her doctor, except that a joint was tuberculous, not stated which or when. Died, 1936.)	—	—	—
C.S. 136 4.ix.35	F., 26	Domestic worker.	Scars in neck from childhood.	Several yrs.	L. upper lobe, chronic and fibrotic.	None.
C.S. 141 5.ix.35	F., 65	Housewife.	No cerv. Ankle and thigh 15 and 10 yrs. ago.	Three or more yrs.	Whole L. lung chronic and fibrotic.	None.
C.S. 181 12.xii.35	F., 19	Home duties.	None.	5 mths. Died April, 1936.	Tuberculous pneumonia.	None.
C.S. 188 11.i.36	F., 41	Housewife.	None.	9–10 yrs. P.T. in 1927. Sputum in 1935, free in interval.	Both lungs slight. No cavities: No hæmoptysis. Gl. in mediastinum.	None.
C.S. 212 3.iii.36	F., 39	Housewife.	None. Early life on croft with one or two cows.	Vague, cough for a few mths. Died 11.iv.36.	Moist sounds all over both lungs; no cavities.	None.
C.S. 219 14.iv.36	M., 32	Farming.	None.	7 yrs.	In 1930, upper third R. lung with cavity. In 1936, whole R. lung, but disease now chronic and fibrotic.	None.
C.S. 228 8.v.36	F., 39	Domestic worker.	Neck gl. incised, 1930. Cerv. caries and retro-pharyng. abscess, 1931. Dorsal caries, 1933.	Not known. Died 11.vi.36.	No pulmonary symptoms up to December, 1934. Widespread infiltration both lungs in April, 1936.	None.
C.S. 236 2.vi.36	F., 26	Domestic worker.	None.	Cough and losing weight 1 yr.	Base R. lung only. Apices free.	None.
C.S. 287 15.xii.36	F., 27	Housewife.	None.	"Weak chest" since school days. Asthma for 5 or 6 yrs. Cough for 2 mths.	Both lungs moist sounds all over.	Yes.†
C.S. 293 29.xii.36	F., 30	Housewife.	—	5 mths. Died 7.i.37.	Bilateral.	None.
C.S. 301 18.i.37	M., 71	Retired cattleman.	—	5 mths. Died diabetic coma.	Whole L. upper infiltrated.	Mother and brother died of P.T.†
C.S. 303 9.i.37	M., 32	Farmer.	None.	Probably 2 yrs., only recently real ill health.	Advanced bilateral disease of both lungs with caseation and hæmoptysis.	None.
C.S. 321 26.iii.37	M., 59	Farmer.	None.	Unwell for 3 yrs., chest and debility, no doctor till 5 days before death, 26.iii.37.	Extensive bilateral. Death due to hæmoptysis.	None. Except one sister who died of meningitis, aged 13.
C.S. Q.12 24.iv.37	M., 25	Farm servant.	None.	† Pott's disease in childhood.	No active signs. Treated for "pulmonary congestion" in April, 1937.	None.‡

* A sister (aged 19) died of pulmonary tuberculosis (P.T.) in 1931. A brother (aged 20) and a sister (aged 18) had neck glands excised at 7 years (1921) and 4 years (1920) respectively. † Uncle and husband's brother died of P.T. Cousin with P.T. alive.
‡ During the period from April 23rd to June 21st, 1937, 106 specimens of sputum, negative microscopically, were examined for tubercle bacilli by culture. All were negative in culture except one (C.S. Q.12) which produced numerous typical bovine colonies after concentration. Tubercle bacilli were demonstrated in the sediment of the sputum 16 days later after it had become fluid through decomposition.

TABLE II—GIVING SEX, AGE, OCCUPATION, AND CHIEF CLINICAL PARTICULARS OF EACH BOVINE CASE—(*continued*)

Case No.	Sex and age.	Occupation.	Previous glandular tuberculosis.	Clinical duration of pulmonary tuberculosis.	Distribution of tuberculosis.	Family history.
				COUNTY CASES—(*continued*)		
C.S. 330 7.v.37	F., 28	Housewife.	None.	Cough practically since childhood. Nothing made out 3 mths. ago. Diagnosed early May, 1937.	Cavity R. apex and one in centre R. upper lobe. Evidence acute T.B. whole R. lung and a few moist sounds at L. apex in front.	None.
C.S. 356 13.viii.37	M., 20	Student.	Excision tuberc. neck gl. December, 1936.	June, 1937.	Bilateral central disease with extension to whole R. lung with marked cavitation.	None.
C.S. 357 5.viii.37	F., 62	Housewife and milker.	None.	"Bronchitis" for last 12 yrs. Sputum first tested in July, 1937.	Lower half R. lung very dense and blurred; rest of R. and most of L. lung much mottling (X ray report). Present condition, extensive bilateral activity with much fibrosis.	First husband died P.T. 1908.
				CITY CASES		
A. 5 8.ii.35	F., 54	Housewife.	None.	Indefinite, never robust; cough and chest pain many yrs.	L., universal multiple cavitation; also R. upper. Old extensive chronic disease.	Yes (see text).
A. 24 20.ii.35	M., 40	Army and then tallow factory.	None.	Indefinite, ? 2 yrs.	R. hilo-apical with cavity in apex. L. central infiltration.	None.
A. 36 12.iii.35	M., 62	Lawyer.	None.	At least a yr.	Both lungs, particularly L. ? cavity L. upper.	None.
A. 41 20.iii.35	F., 24	Clerk.	Abd. gl. at oper. at 5 yrs. (Cerv. gl. excised at 9 yrs.)	Since November, 1934.	Bilateral, very extensive, rather acute type with recent cavities.	Mother's side.
A. 57 13.iv.35	F., 25	Warehouse attendant.	Neck, axill., and abd. gl. calcified.	L. pneumonia February, 1932.	L., patchy infiltration mostly central with cavities in upper zone. R., calcified spots throughout and in hilum.	One sister P.T., one brother neck gl.
A. 63 17.iv.35	M., 24	Van-driver.	None.	Cough over a yr.	Bilateral, very extensive old disease, R. mostly central and L. apical, cavities both areas.	Father ?
A. 68 30.iv.35	F., 34	Housewife.	Calcified gl. in neck.	5 wks.; hæmoptysis 10 days before admission.	L., moderate with apical cavity. R., only central and radial opacities, no infiltration.	Uncle died P.T.
A. 73 13.v.35	F., 20	Telegraphist.	None in neck, abd. T.B. disease suspected.	Bronchitis 4 mths. before death.	L., very large cavity upper zone. R., central infiltration, acute lesion with small cavity in extreme apex.	Three aunts died P.T.
A. 104 27.vi.35	M., 29	Lithographer, forestry comm., hospital attendant.	None.	Indefinite, "smokers' cough" for 2½ yrs.	Bilateral, R. subapical and cavitation; L. upper entirely with cavitation. Improved under treatment.	None.
A. 110 10.vii.35	F., 33	Bookkeeper.	None.	2½ yrs. at least.	Progressive disease confined to R. lung—mid and lower lobes. Improved under treatment but large central cavity persists.	None.
A. 138 18.x.35	F., 24	Housewife.	No neck gl. "Typhoid" at 12 or 13. Appendicectomy at 13.	7 or 8 yrs.	Bilateral extensive, espec. L.; large cavity L. apex and smaller ones below. R., large subclavicular cavity.	None.§
A. 191 14.iv.36	M., 32	Joiner.	None.	6 yrs. at least.	R. upper lobe cavity.	None.
A. 199 28.iv.36	M., 30	Bank accountant	None.	About 1 yr.	Bilateral, L. apex (older) and R. lower (acute spread). Laryngitis.	None.

§ Parents were farmers. When patient was 14 a cow whose milk was drunk at home died of tuberculosis.

part of a primary egg culture, or about 80 bacilli according to an estimate by cultivation. Of the rabbits 11 died of acute general tuberculosis in 14–24 days; 2 that received a millionth of a primary culture died of typical severe general tuberculosis in 66 and 88 days. The remaining 39 died of typical disease in 25–63 days (average 38·1 days).

Fifty-two rabbits were injected subcutaneously with 10·0 mg. of culture or less (48 strains from 39 cases) and died in 29–104 days; 2 of the rabbits, each inoculated with a different strain, showed only slight general tuberculosis after 29 and 32 days; each of these strains caused typical severe general tuberculosis in another rabbit. Only 6 of the rabbits lived longer than 79 days, dying of typical severe disease in 84, 89, 90, 91, 100, and 104 days respectively. The remaining 45 died in 33–79 days (average 57·8 days) of typical "bovine" general tuberculosis.

One rabbit was inoculated subcutaneously with sputum from C.S. 103, the dose being 0·25 c.cm. The animal died of severe general tuberculosis in 67 days.

CLINICAL DETAILS

Of the 44 persons with bovine bacilli in the sputum 15 were males and 29 were females; their ages ranged from 17 to 71 years. The duration of the clinical tuberculosis from the first appearance of symptoms to the date of the first sputum examination ranged from a few months up to 9 or 10 years.

In 7 instances there was a long history of chest trouble with no definite date of onset. In 11 of the 44 cases there was previous glandular tuberculosis, occurring in the neck in 9 (also abdomen in 1) and in the abdomen in 2 instances. In 2 further cases (A. 73 and A. 138) there were abdominal symptoms in early life the cause of which was not established. One patient suffered from previous bone and joint tuberculosis. The periods elapsing in 7 cases between the diagnosis of glandular tuberculosis and clinical signs of pulmonary tuberculosis ranged from 6 months up to about 18 years. In the remaining 4 cases the periods were indefinite.

Of the 44 bovine cases 19 (14 females and 5 males) were married and had altogether 57 children. Of these 5 died in infancy; 1 died of pulmonary tuberculosis before the bacteriological investigation of the mother's sputum and 51 were living when the parents' sputum was examined. Of the surviving children 45 were apparently well; 3 had coughs when examined but were not clinically tuberculous; 1

had had a leg amputated on account of "bone disease" and 2 of 3 tested with tuberculin gave a positive skin test.

A family history of tuberculosis was given in 13. Material for bacteriological investigation was not available from any of the affected relatives owing to their death before the bovine case was diagnosed. We give a brief account of the history of one patient, many of whose relations died of tuberculosis.

A. 5.—The patient was born and brought up on a croft with one cow. She had never been robust and suffered from occasional cough and chest pain for many years. When examined at the age of 54 (in February, 1935) there was extensive chronic disease with universal multiple cavitation on the left side and similar disease of the right upper lobe. She died on May 27th, 1935.

Her mother died at the age of 73 of chronic bronchitis and her father (age unknown) died of "pneumonia" which was said to be probably tuberculous.

The husband, a stone-cutter, who had spent most of his boyhood on a farm, was notified in March, 1935, when he was found to be suffering from advanced pulmonary tuberculosis, especially on the right side. He died in April, 1935, three weeks after he was notified. Sputum was not sent for examination.

Two years before the wife came under observation two of her brothers died of pulmonary tuberculosis, aged 39 and 53 years respectively.

There were six children, three of whom died in infancy. A daughter was notified in 1929, at the age of 14, as suffering from pulmonary tuberculosis. She died of tuberculosis two years later. A daughter, aged 26, was radiographed but nothing definitely tuberculous was seen. Another daughter refused to be radiographed.

REGIONAL DISTRIBUTION

Of the 44 bovine cases 13 occurred among the 294 persons from the city of Aberdeen. The bovine cases in this series are unevenly distributed, 8 of the 13 occurring in the first and 5 in the second hundred, while among the last 94 there is no instance of bovine infection. On inquiring into the histories of the 13 city cases we found that 7 were brought up, or as children had spent their annual holidays on farms and were therefore probably primarily infected in the country. Though we did not obtain a similar history in any of the remaining 6 city cases the possibility that some of these persons may also have been infected with bovine bacilli during visits to the country cannot be excluded.

The remaining 31 cases of bovine pulmonary tuberculosis were found among the 342 county cases and were distributed throughout the series. The first hundred positive cases contained the greatest number of bovine infections—namely, 13, which is only one less than the total for the next *two* hundred cases (7 and 7 per cent.) The last 42 cases have yielded 4 instances of bovine infection. Table I gives the proportion of human (divided into eugonic and dysgonic) and bovine strains found in the different counties and in the city of Aberdeen.

The 31 county cases were distributed among four counties on the mainland and the Orkney Islands. In our first report the 13 cases recorded occurred in three counties—Aberdeenshire, Banffshire, and Morayshire—giving, as already stated, the high percentages 15, 18, and 25 respectively. The additional cases from these counties examined since then have contained a smaller proportion of bovine infections and have reduced the previous percentages to 8·6, 11·6, and 12·5 respectively. The new county in which bovine cases have been brought to light is Caithness, where 2 out of 15 (13·3 per cent.) were found to have bovine tubercle bacilli in the sputum. From the Orkney Islands, although only 13 cases have so far been examined, no fewer than 4 (30·8 per cent.) were bovine infections, whereas from the Shetland Islands none of 34 cases was due to this type of bacillus. Four counties—viz., Kincardine, Inverness, Sutherland, and Nairn—have not as yet yielded a case of bovine pulmonary tuberculosis though from the first county as many as 25 cases have been examined. The remaining three counties together have contributed only 7 cases.

CASES YIELDING TUBERCLE BACILLI OF THE HUMAN TYPE

The cultures from 592 cases belonged to the human group of tubercle bacilli. Of these 570 were typically eugonic and 22 exhibited the cultural characteristics and virulence of the dysgonic variety of the human type.

The ages of the patients, of whom 318 were males and 274 were females, ranged from 9 to 83 years. Of the 281 city cases 14 were under twenty and 59 over fifty, and of the 311 county cases 28 were under twenty and 39 over fifty.

The bacilli in the sputum of two cases showed numerous branched forms. The cultures from these sputa were typically eugonic and exhibited for the rabbit and the guinea-pig the virulence of the human type of bacillus.

Cattle contacts.—Only 7 of the 44 bovine cases came into direct contact with cattle in their employment or occupation. One of them (C.S. 19), an occasional farm-worker, had had cervical gland tuberculosis in childhood and was probably infected with bovine bacilli through milk. The remaining 6 persons gave no history of glandular tuberculosis, either in the neck or in the abdomen. Three were farmers, one was a cattle-dealer, one was a farm servant, and one was a milker. Two of the farmers and the cattle-dealer died a day, a few weeks, and 4 months respectively after their sputum was sent for examination.

Of the 311 persons (county cases) with tubercle bacilli of the human type in the sputum 33 were employed on farms.

SUMMARY

(1) Cultures of tubercle bacilli have been obtained from the sputum of 636 cases of pulmonary tuberculosis occurring in north-east Scotland, 342 from the rural and small urban districts, including the Orkney and Shetland Islands, and 294 from the city of Aberdeen.

(2) Of the 342 county cases 31 (or 9·1 per cent.) and of the 294 city cases 13 (4·4 per cent.) yielded tubercle bacilli of the bovine type.

(3) All the strains, 84 in number, obtained from the 44 bovine cases were typically dysgonic and fully virulent for rabbits.

(4) Of the 31 county bovine cases 12 were contributed by Aberdeenshire (8·6 per cent. of 139 cases), 8 by Banffshire (11·6 per cent. of 69 cases), 5 by Morayshire (12·5 per cent. of 40 cases), 2 by Caithness (13·3 per cent. of 15 cases), and 4 by the Orkney Islands (30·8 per cent. of 13 cases).

(5) No bovine case has yet been found in the other counties—32 cases examined—or in the Shetland Islands among 34 cases.

Our thanks are again due to Dr. H. J. Rae, chief regional medical officer, to Dr. G. S. Banks, regional tuberculosis officer, to the medical officers of health of other authorities, and to very many medical practitioners for their courtesy and kindness in supplying specimens and information.

REFERENCE

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MEDICINE AND THE LAW

Progress in the Prison

THE annual report of the Commissioners of Prisons (Cmd. 5675. 2s.) shows that in 1936, the year under review, the prison population is still falling. Nowhere is the improvement more striking than in the statistics for women; the number admitted in 1936 is less than half the number for 1921 and hardly more than a quarter of the number for 1913. Nearly half those received on conviction in 1936 were elderly female offenders against the liquor laws. Most of these seem to be taking their admission as a period of recuperation between one drinking bout and the next. The type is not being recruited from among the younger women, and in a few years' time the totals will be negligible. The health of both sexes remains good. Interesting progress has been made with the surgical unit established at Wormwood Scrubs nearly two years ago. In the nine months of 1936 there were 78 operations, in 1937 there were 142. There were 45 for radical cure of hernia, 32 abdominal sections, and 5 laparotomies for removal of foreign bodies purposely swallowed. Mr. Guy Chambers, the visiting surgeon, is reported as having gained the entire confidence of his exacting patients. There is so much work that on operating days a sister is borrowed from Holloway prison to help the permanent sister at Wormwood Scrubs. Emphasis is laid on the proved advantage of employing nursing sisters for male patients convicted of all sorts of crimes. This experience is confirmed even at Parkstone where the most difficult convicts in the country are assembled. Dr. Norwood East, the medical commissioner, evidently looks forward to the day when there will be a nursing sister on the staff of every large prison. These surgical operations at Wormwood Scrubs are additional to the ordinary system of releasing prisoners for operation in local hospitals. Borstal youths, it is said, frequently ask for operations to fit them for ordinary work during their Borstal training and on release.

Dr. East contributes, as usual, some wholesome observations upon criminal responsibility and culpability. The two things, he reminds us, are very different, and the failure to distinguish between them is bad alike for society and for medical reputation. Criminal conduct he regards as just a variant of ordinary human behaviour, not necessarily or even usually allied to mental disorder. Irresponsibility, or a lessened degree of culpability, is put forward almost daily as a defence when there is nothing to support it but an abstruse psychological hypothesis which has no relation to the case before the court. A young man, for instance, attacks his father in defence of his mother. At once the incident is put forward as an example of the œdipus complex even though his attachment to his mother is normal and free from incestuous desires. Dr. East has clear views as to the classes of prisoner for whom psychological treatment is profitable. He mentions the work done at Wormwood Scrubs with selected prisoners by Dr. W. H. de B. Hubert who joined the staff as psychotherapist in 1934. The four-year programme then initiated is now nearly completed and we are promised presently a statement of the conclusions emerging from this study. Meanwhile we are warned not to expect too much. The normal man, if such a creature there be, has, in Dr. East's opinion, a stronger tendency to break the law and to acquiesce in certain offences than has sometimes been supposed. It is convenient to think of him as normal if his law-breaking cannot be attributed to pathological causes. The number of offenders in this normal group is high. Psychological treatment is not for them.

Of prison life in general the commissioners tell a rosy tale. There are libraries and cinematographs, wireless, and physical training, a revolutionary scheme of earnings for work done, and cigarettes to be smoked in the cells. Coat-frocks for the women replace the old ill-fitting uniforms and give a new sense of self-respect. Long-term star convicts go from Maidstone to Dartmoor in the summer months. The Borstal institution grows daily more like the public school. And yet, in spite of all, the prison population is still falling.

AN AMERICAN HEALTH PROGRAMME

SOME three years ago President Roosevelt appointed an interdepartmental committee to coördinate the health and welfare services of the United States government, and last month the committee received from its technical subcommittee a report which the chairman, Miss Josephine Roche, has submitted to the President. The report states [1] that though great advances have been made in America in the control of disease and the promotion of health, the amount of preventable sickness and disability that still continues and the prevalence of avoidable economic burdens due to sickness costs afford grounds for grave concern. This is not because there is lack of knowledge; in some respects the resources exceed the need. But there are economic barriers between those needing service and those willing to render it, and the situation calls for a national plan for the economic application of resources to improve the health of the people.

The subcommittee recall that in a representative sample of the urban population studied in the recent national health survey 40 per cent. of the persons were members of families with annual incomes of less than $1000; 65 per cent. of families with less than $1500; and 80 per cent. with incomes of less than $2000. In 1935 about one-half of the group with incomes under $1000 received relief during some part of the year. Estimates made of the cost per head of providing adequate medical care range from $100 a year per family of four to double that amount; and an examination of family budgets shows that families with incomes not exceeding $1000 a year cannot afford to spend $100, on the average, for medical care. The subcommittee think this is probably true also of families with incomes not exceeding $1500. They conclude that at least one-third, perhaps one-half, of the American people are too poor to pay the full cost of the medical services they need. The position has been mitigated by an extensive development of free, or part-payment, clinics and hospitals in recent years, and by much gratuitous service given by the medical profession, but the report states that "the fact remains that large costs still fall on small purses." For the families of wage-earners the position is specially serious; for the maximum need of medical care often arises when disabling sickness has caused loss of wages. This is a risk against which the wage-earner cannot budget individually, and the subcommittee think there is urgent need for social insurance or systematic public assistance.

[1] See *J. Amer. med. Ass.* Feb. 26th, p. 656.

According to the report, there are 165,000 medical practitioners in the United States, or 128 per 100,000 of the population. This number is thought to be sufficient if the practitioners were evenly distributed; they are now too much concentrated in the large towns. This is true also of private nurses, and there is a serious deficiency of public health nurses. The number of dentists is 71,000, and estimates of the need for dental care indicate that this number could be doubled without exceeding the true need. The number of hospital beds in the United States is stated to be about 1,100,000, and it is estimated that 400,000 more beds are required, and that the additional provision should include at least 500 hospitals of from 30 to 60 beds each in rural areas with inadequate hospital facilities. It is also recommended that special hospitals should be provided for chronic diseases—e.g., cancer, diabetes, heart and circulatory diseases, and kidney diseases—which owing to the continued ageing of the population are assuming greater importance. Such diseases require much individual attention, which can often be given more effectively in a hospital with modern facilities for diagnosis and treatment than by a *private* practitioner. It is estimated that 250,000 additional beds should be provided for such cases.

THE RADIOGRAPHER'S LIABILITY AT LAW

THE radiographer is a highly trained expert who handles delicate and potentially dangerous mechanism. In spite of all precautions mishaps are bound to occur from time to time, and a patient or relative may sustain injuries which lead him to seek compensation by an action at law. The Society of Radiographers, feeling that the risk to their members is an important one, held a mock trial at the Cowdray Hall, London, W., on March 19th, to illustrate the legal position.

The case of Martin *v.* Northside Hospital and Violet Wray, which took place before a large and delighted audience, was a triumph for Mr. Cuthbert Andrews, the producer. His legal procedure may not have been accurate in every detail—he disclaimed any attempt to make it so. But the cast succeeded in reproducing the atmosphere of a King's Bench court so faithfully as to cause the illusion in at least one visitor familiar with it that he was in his usual place of work. The light comedy which was the keynote of the trial was well thought out and maintained. Particularly appreciated were the learned judge's question: "What is a radiographer?," introducing a concise didactic definition by the radiologist witness, Dr. E. Rohan Williams (part-author, with Dr. Duncan White, of the script); and his lordship's profound slumber during an interminable lecture on X ray risks in general by the expert, Prof. Littlar (Mr. G. W. C. Kaye, D.Sc.). The summing-up, and a quite irregular peroration after the verdict, set out the principal object of the trial.

Mr. Crawland Snoop, K.C. (Mr. Cuthbert Andrews), for the plaintiff, was incredibly realistic and exactly like some not quite identifiable member of the Chancery Bar; Sir Archibald Head, K.C. (Dr. J. Duncan White), appeared for the defendants. The judge was Mr. Justice Likely (Mr. J. A. Crowther, Sc.D.).

The subject matter of the action was simple. A mother, helping to hold her small boy during a radiography after an injury, had jumped up at the moment of exposure and received a somewhat severe electric shock, and sued the hospital and the lady radiographer in charge. The hospital was dismissed from the suit at the outset on a submission in law, and the radiographer was found not to have been negligent.

Opening the case, Mr. Snoop said that the youngest child of his client, Mrs. Maria Martin, while playing some boyish game, fell and hurt his arm. His mother took him to the Northside Hospital, where it was decided that the limb should be X rayed. While the child was under the X ray the mother received a terrible electric shock and had not yet, months after the accident, fully recovered her mental equilibrium. At great personal inconvenience she had compelled herself to three weeks' inaction at a resort called Southend-on-Sea. She claimed substantial pecuniary solace for the immediate effects of the injury, recompense for disbursements made during her convalescence, and damages as a deterrent to the future involvement of our needy and afflicted poor in such an accident.

Sir Archibald Head then submitted that there was no case against the hospital, for it could not be held responsible for individual acts of its technical employees if it had taken steps to ensure that they were properly qualified. It was manifestly impossible for an overworked and harassed chairman of governors to spend his spare minutes tasting the gruel in the kitchen and counting the bloody sponges in the operating theatre. The judge, on the authority of Hillyer *v.* St. Bartholomew's Hospital (1909, 2 K.B. 820), dismissed the hospital from the action, but ordered the case against the radiographer to proceed.

Mrs. Maria Martin, of 27, Red Barn-court, said that the young lady had put the boy on a table and put a "lamp thing" on top of him and told her to sit down, and then she felt a dreadful pain and knew no more. On cross-examination she admitted that the radiographer had said "Sit there and keep quite still." A friend, Miss Amelia Hobbs, spoke of the ill effects of the shock and admitted having gone to Southend with the plaintiff and her sister. A radiologist, Dr. O. H. Maloney, said that the radiographer was most competent and reliable both in her hospital practice and as assistant in his private practice. He described in detail the qualifications required of a radiographer. The judge remarked that the specification sounded like an alliance between the Admirable Crichton and a member of the Angelic Choir.

Miss Violet Wray, the radiographer, said that she held the diploma of the society. She had arranged the tube and set the controls for a rapid exposure, and had told the mother to sit on a chair, keep the child still, and not to move herself. Just as she made the exposure, the child moved and Mrs. Martin jumped upwards and forwards; there was a flash in the region of her head and she sat back in the chair. Miss Wray had found a burn on her scalp and another beneath her suspender buttons; neither was severe. Her conduct of the examination was in accordance with her training and with usual hospital practice.

Prof. Littlar, expert witness for the defence, explained that the voltages used in X ray work were so high that the current might jump across a wide air gap. He outlined the requirements of the International X Ray and Radium Protection Committee and said that a radiologist must impress upon the governing body of his hospital the necessity of complying with these recommendations in every respect.

His lordship summed up, and the jury found that the radiographer had committed no negligence. The judge, agreeing with their findings, remarked that radiography was not free from danger and that, as human beings were not infallible, actions such as the present one were bound to arise. He understood that X ray technicians and other medical auxiliaries had no protection or defence society. It seemed to him a somewhat dangerous state of affairs that such responsible workers as radiographers should be exposed to the hazards of legal proceedings which, even if successfully defended, might impose on them a crushing burden of expense. The Society of Radiographers would do well to consider the possibility of forming some kind of mutual defence society.

With an admittedly serious purpose to fulfil—the establishment by the society of a scheme of legal insurance for members, analogous to that provided by the medical defence societies—it is a great pity that the authors of this burlesque should have missed an opportunity. By dismissing the hospital from the

suit on grounds which would not have been entertained for a moment by a real court, they evaded altogether a problem at least as important as that of the personal liability of the radiographer. It is, of course, quite possible that a hospital might escape liability for the negligence of a radiographer engaged in her work. The Scots case of Anderson *v.* Glasgow Royal Infirmary (1932, S.C. 245) concerned an injury due to over-exposure during ultra-violet light treatment given by a nurse, and the Court of Session found by a majority that even if the nurse had been negligent the hospital would not have been liable for the consequences. Lord Alness delivered a powerful dissenting judgment which may in future cases carry even more weight than it does at present. The hospital, however, could hardly escape liability if the patient could show that the X ray apparatus was either defective or its design was dangerous and constituted a trap for the unwary. The patient and his mother were quite possibly in the position of "invitees," for whom the surroundings must be made safe. In these days of shock-proof apparatus a case of negligence might almost be made out against a hospital merely for providing an outfit capable of administering a potentially fatal shock to an onlooker who did nothing more than make an incautious movement.

In dealing with the case against the radiographer herself, the authors omitted to include any evidence of negligence at all, and Mr. Crawland Snoop did no more than prove the occurrence of the shock and some resulting injury. Much could have been made of the radiographer's failure to explain to the mother that unless she kept quite still she would run a risk of receiving a shock. The fact that she was helping the radiographer by holding the child might well make the duty to protect her even more imperative than if she had been a mere spectator. These points, and also the evidence for her own contributory negligence in moving during the exposure, might have received closer attention.

The argument for the provision of a defence scheme is none the less valid, for radiographers, in common with many other classes of non-medical workers entrusted with the use of powerful electrical apparatus, are exposed to a definite legal risk. The chances of injury with a diathermy machine are probably very much greater. Moreover, many persons are coming to hold that some form of insurance ought to be provided in the interests of the patient for all non-medical assistants, including hospital nurses. Under the present law the hospital is hardly ever held responsible for the negligence of a nurse in the performance of a technical duty, and the assistant is not likely to have the means to satisfy a judgment for damages.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index

FROM VRATCH

IV

THE first Revolution which overthrew the Tzar did not immediately affect the medical work in my village. But within a few months aged patients came complaining of symptoms quite unheard of among the villagers before. Presbyopia had not previously affected the daily life of the peasant, he did no near work; when he cut logs to build his house or sawed wood to make the window frames he did not measure closer than an inch. Old men came to me with aching eyes; for they were learning to read now that they could do so without incurring the suspicion that they wanted to revolt. They borrowed school books and took instruction from their grandchildren. Of their land-hunger there had been much talk before the Revolution came, but I never guessed that the craving for learning would be so strong. It goes to show that when people are denied opportunity for self-development their true level cannot be judged while they are still under subjection. What these good souls got from their reading, their slow fingering of each word, each letter, was certainly but little of the author's meaning; no matter, they said, their children would learn quicker than they did, and in time all would read as freely as the priest.

When a priest moves among his flock he carries with him inevitably something of another life than this of ours on earth, so be he never so human he always sees men as they think they ought to be. But in the great crises of life as well as in the vexing little ailments and injuries, the doctor is called in to help his patients to cling to this morsel of flesh, to get over painful times and get deeper into the present with its everyday activities and its round of duties and cares. For this reason I found my opinion more often sought by the peasants than was that of the priest. His views coloured by his professional attitude to the future, they felt, were not as gross and earthly as theirs or mine.

Much of the aggressive element in the Russian disposition had in the old régime been turned inwards under the influence of an unusually mystical religion and an exceptionally autocratic régime, so that the people were submissive—not docile, that is too passive a concept—and unself-confident, but subject to outbursts of self glorification and indignation against their oppressors. Furthermore they were taxed so heavily that they spited the government by remaining poor. When I asked why with their communal ownership of lands they did not communally own a threshing machine and so save themselves the back-breaking work with the flail or the wasteful treading of the grain by oxen, they answered that they would go on as they were doing rather than give the tax-gatherers the excuse, because they could afford machinery, to raise their dues.

* * *

It has puzzled many how the new régime acquired the power it wields over the minds of the people, since it first taxed the peasants as heavily as did Tzardom and then liquidated them. Apart from the important fact that a majority of the present citizens of the Soviet Republic have never known another régime, I think the main source of its strength lies in the new direction given to the aggressive impulses of the people. When Lenin said "Peasants! seize the land!" many of them had already done so; when the Bolsheviks said "Workers, exploit your every opportunity!" the message did not fall on deaf ears. Work was to be their salvation and factories their new chapels; here they could pit themselves against materials they had hardly dared touch before, lest they call down on themselves an inquisition from the Governing Powers. The tax-greedy bureaucrats stood between the energies of the people and the earth from which they derived both their life and their strength.

In another direction also the new régime met a need of the people. The Orthodox Church had in practice (I do not speak of the theory) two ways of

dealing with the aggressive impulse; if turned outwards it must be at the service of the Tzar and the State, but it was better to turn it against the self by fasts of inordinate length and most lowering to the physique (my Tartar patients were invariably fitter men at the time of spring ploughing than the Christians), and by a constant preoccupation with the worthlessness and wickedness of the self in wretched contrast to the ineffable glory and kindness of God.

* * *

The brutal anti-God campaign of the Bolsheviks was an endeavour to tap sources of energy of the people. Do not wallow in guilt and self-abnegation! they said in effect, there is nothing to fear but yourselves. Possess yourselves of Russia, master it by work, don't pray for strength to overcome evil, work to make this land and this life better. For the first time the people were both appealed to and given a chance to turn their energies to constructive work. Taxation which gave a minimum return in the way of social services—witness the scarcity of State doctors, in the country districts there were no others—and political oppression lowered the productive interests of the people and bred a hatred of the State. At the same time the hold of the Government was strengthened by suppressing education, freedom of movement, and the marketing of a man's own labour, and by using the Church as an auxiliary of the temporal power. But though the Bolsheviks pulled down the old Gods they set up other Gods in their places, the strong, half-Oriental, cynical portrait of Lenin, a Russian like themselves, was even in his life-time offered for their worship—and accepted.

* * *

There can be no two opinions as to the extent of the change produced by the new religion of work and the new theology of dialectical materialism. The people were free to exploit their energies in a way undreamt of before. Gaffer comes for reading-glasses, the grandson goes to technical schools; the one has begun to give expression to his desire to know more of what is going on around him, the other to master a more complicated trade than his father—to become *skilled*. In the view of the new régime not only the wealth but also the happiness of the people depended on freedom to acquire and use skill. What applied to trades applied also to professions. Tens of thousands of "medical assistants" were trained at short notice to bring medical help to the villages and towns. Their curriculum was sketchy but they were missionaries for better sanitation and a care for health. Only those who knew what conditions were like before should judge of the wisdom of that policy. It is not pleasant to think of the country being over-run by half-trained medical men, but they were better than gamps who use lamp-hooks on a retained placenta, and as the supply of better trained doctors improved, these men could finish their studies.

* * *

The materialist philosophy which guided the energies of the people to constructive work and to the acquisition of skill, and which therefore diminished the tendency to depression, introspection, and pessimism so common in the old régime in all classes of the community, may thus be said in a measure to replace the institutions which ministered to the spiritual needs of the people and furnished them with ideals. But the desire to employ science in the service of man is more readily fulfilled in the physical sciences than in the mental. It is easier to get men to improve their manual skill than it is to change their inner ways of thought.

The almost fantastic depths of self-abnegation and submission common in the days of the mystical Tzardom is not in theory favoured as a national trait by materialist Commissars. But though, according to plan, the workers have risen in their pride, overthrown their oppressors, and asserted their rights as a free people, there is from time to time still an organised orgy of penitence—by proxy. In the State Trials the attitude of objectivity which characterises so much of modern Russian life is laid aside and the accusers, the accused, and the "organs of opinion" (the Press and the Platform) give themselves over to an exercise in moralising and subjectivity that can only come from inner tension and self-distrust.

The service of the materialist revolutionaries has been great, they have opened out a new life to a people who were vilely oppressed, have raised them up and given them not only new hope but the means by which they can consolidate their gains; but the new materialist mode of thought has no rational way of dealing with the inner life of man. It denies the old gods and sets up new idols for worship; to every discovery of science it lends the readiest ear, except those which deal with the sufferings of the mind, and these it does not seem able to probe—or acknowledge.

The Russian attitude towards feelings of guilt has always seemed strange alike to Western and Eastern peoples. In the religion of the old régime it was a central theme, in that of the new it is denied in relation to everything except the State. In the place of the old blasphemy—thoughts of hate against God and not believing in His goodness—there is now the sin of not believing in the perfect suitability of the present rulers and the present materialist philosophy for the needs of the Russian people. Discontent is taken as a sign of the unpardonable sin working in a diseased mind.

The materialism of the present rulers has put them into an awkward predicament; by attempting to eradicate every trace of superstition and bourgeois mentality and presenting the Socialist State and its founders as an object of adoration, they have given their people no alternative to either loving or hating the central power. It is a dilemma which faces the Totalitarian Dictators too. The psycho-analysts have pointed out the way in which the parliamentary governments have overcome the problem: the constitution provides for a permanent or untouchable portion of the governing power (a king or president) and a removable portion (cabinet) which can be sacrificed without disturbing the loyalty to Authority. Thus discontent can find a safe outlet without disturbance or serious break in the function of government, and it is impossible for the executive to bedeck itself with the glamour of omnipotence and omniscience, which is always corrupting to wise judgment. Democracies may bestow dictatorial powers upon an individual for a special occasion, as in time of war or crisis; power thus freely *bestowed* implies the constraining force of a sense of responsibility. It is different when power is *seized*. Violence may be necessary in politics; but violence, however good the end in view, generates feelings of guilt. It is scientifically foolish, and, I believe, in the long run politically imprudent, to deny a factor so important in mental—or political—life.

* * *

Every one of us had mixed feelings on hearing of the fall of the Tzar, nearly everyone rejoiced at the release from constraint, most of us felt that a great

responsibility was laid upon us. Innocent though we were of the great political event, we felt obliged to shoulder the burden caused by our phantasied complicity in having desired it. The murder of the Tzar deepened the sense of guilt because the image of the Little Father embodied a high ideal.

The ruthless attack on every pre-revolutionary idea and ideal, which followed the Bolshevik seizure of power, can I think be ascribed also to unconscious guilt. If every feature of the bourgeois régime was vile, then the destruction of it by the new government was no crime. Their inner knowledge that not all of it was bad made their hate an intolerable burden on the conscience, and not daring to acknowledge that in the spirit of vengeance they were rooting up wheat with the tares, they declared the whole field fit only for the flames. Such conduct in individuals breeds a troubled mind, and in communities not less.

The denial of the inner life of man (and also, though I have not discussed it here, the attack on the family) seems to me the gravest fault in the Communist régime in Russia; but serious though this is, it must not blind us to the great achievement of the revolution: the Communists have encouraged the initiative and ambition of the people to acquire skill and to use it freely and for the first time in mastering their new possession—their own country.

*** *This concludes the four articles by Vratch. Next month A Consulting Physician will be responsible for these columns.*—ED. L.

PUBLIC HEALTH

Consultant and Specialist Service in London

THE consultant and specialist service in London was first organised on a uniform basis five years ago. The general hospitals were grouped geographically and the various special hospitals, residential schools, and public assistance institutions were linked up with them. This system has worked satisfactorily and has been developed mainly by adding specialties or increasing the number of sessions as required—for example, to ensure adequate supervision of fracture cases and skilled anæsthetists for special operations. The latter have also helped to diffuse the latest methods among the hospital staffs. Three full-time radiologists have been appointed, each serving a number of hospitals, and part-time obstetricians and gynæcologists have replaced the specialists employed under the group scheme. The L.C.C. now claims that it has provided a service which, in its comprehensive character, is probably unequalled elsewhere.

Welfare of the Blind

The Minister of Health has issued a circular to local authorities explaining the provisions of the Blind Persons Bill which comes into operation on April 1st. Under this Bill the age at which a blind person becomes eligible for an old-age pension is reduced from 50 to 40 years, and local authorities are required to provide all assistance to blind persons, other than institutional and medical assistance, under the Blind Persons Acts, thus removing the blind almost entirely from the operation of the poor law. In calculating the amount of financial assistance to be granted to a blind person the needs of his dependants are to be considered and sources of income such as National Health Insurance benefit, disability pensions, workmen's compensation, and the like are to be disregarded, as is now done with applicants for unemployment assistance.

Referring to the recent report on cataract by the Prevention of Blindness Committee of the Union of Counties Associations, the Minister agrees that the facts in regard to operative treatment for cataract should be made more widely known. In considering whether a person who has had the lens extracted from one or both eyes is still to be regarded as blind the Minister quotes the statutory definition of a blind person as "a person so blind as to be unable to perform any work for which eyesight is essential," and does not accept the committee's recommendation that the blind person's vision should be tested with reference to his ability to carry out the work on which he was formerly employed. During the three months after operation normally required for adjustment to the new conditions the patient may still be regarded as blind, and in cases in which, after the extraction of the cataract, the corrected visual acuity is between 3/60 and 6/60 Snellen, the fact that two pairs of strong glasses have to be used for near and distant objects respectively may justify a decision that the person is still blind.

Survey of Hospitals in Cornwall

Dr. E. Donaldson of the Ministry of Health and Mr. R. H. P. Orde, hon. secretary of the British Hospitals Association, have now issued their report on the survey of the hospital situation in Cornwall which they made at the hospitals' request last November. There is no natural centre of population in Cornwall around which its hospitals and health services can conveniently group themselves, and the county is served by five larger hospitals with from 40 to 80 beds and ten cottage hospitals with less than 30. The only hospital which can be classed as a general hospital is the Royal Cornwall Infirmary at Truro, though the West Cornwall Miners' and Women's Hospital at Redruth is developing in that direction. Only the West Cornwall Hospital at Penzance shows signs of being overcrowded, and in no less than eight hospitals the percentage occupation in 1936 was under 65. According to this report there is hardly any coöperation between the various hospitals. There is no attempt to centralise the treatment of fractures, no uniformity in the keeping of records, and the hospitals do not work together in their appeals for funds. Most of the cottage hospitals try to act as miniature general hospitals and the public assistance committee are dependent on the voluntary hospitals for the treatment of all patients needing operations and practically all who are acutely ill.

The report recommends that the existing hospitals of Cornwall should be divided into two groups: a large group based upon Truro and Redruth, and a small one based upon Plymouth. It is unfortunate that the towns of Truro and Redruth, which are only eleven miles apart, did not build a joint hospital which could have acted as a key hospital for the whole of Cornwall. There should, however, be a bringing together of the boards of management of Truro and Redruth hospitals, their staff should be regarded as belonging to one institution, and everything should be done to create in essence a Truro and Redruth hospital which would be one in everything but its buildings. Each hospital should

continue to develop the special departments in which it has already specialised, Truro developing as an orthopædic centre with a fracture clinic, throat, nose, and ear department, and ophthalmic department, and Redruth providing a maternity and radiological centre linked to the national radium centre at Plymouth. St. Michael's Hospital at Hayle could usefully be used for those patients who require a long stay in hospital and who tend at present to congest the voluntary hospitals or to drift into public assistance institutions.

The formation of a voluntary hospitals regional council, as advocated by the Sankey Commission, would provide a centre for the consideration of problems which cannot be wisely solved by the hospitals acting separately and would supply doctors with the data which is now deprived of much of its value by lack of organised recording.

Medical Members of L.C.C. Committees

The various standing committees of the London County Council include the following medical members:—

Education.—Dr. J. A. Gillison.
Entertainments.—Dr. Bernard Homa.
Establishment.—Dr. Homa.
Finance.—Dr. S. W. Jeger.
Fire Brigade and Main Drainage.—Dr. C. W. Brook.
Hospitals and Medical Services.—Dr. S. Monckton Copeman, Mr. Somerville Hastings, Dr. Homa, Dame Barrie Lambert, Miss Esther Rickards, with Dame Janet Campbell and Dr. Hyman Winch (coöpted), and Dr. F. Lawson Dodd, L.D.S., on a subcommittee.
Mental Hospitals.—Dame Barrie Lambert, with Dr. Doris Odlum (coöpted).
Public Control.—Dr. Jeger.
Supplies.—Dame Barrie Lambert.
Welfare of the Blind.—Dr. Brook.

IRELAND

(FROM OUR OWN CORRESPONDENT)

HOSPITAL DEVELOPMENT IN DUBLIN

A FEW weeks ago the Minister for Local Government and Public Health announced that he was prepared to approve the scheme of hospital development for Dublin which had been recommended in the first report of the Hospitals Commission, and he invited the hospitals concerned to submit their plans to him. The first to obtain official sanction for its plans is St. Vincent's, which proposes to transfer itself from its present site on St. Stephen's Green to a country site at Merrion. It was known that a few years ago the authorities of St. Vincent's—Sisters of the Order of Charity—had purchased the extensive demesne of Elm Park at Merrion with a view to building there, and building will begin forthwith. The property purchased contains some twenty-five acres of open land, and although quite in the country is within the present city boundaries. It is proposed to build a hospital of 550 beds, of which 400 will be for free patients (those not contributing more than ten shillings a week), 100 for poor patients (those for whose maintenance the rating authorities would be responsible), and the remainder for paying patients. It is not known whether the present premises in St. Stephen's Green will be entirely abandoned, but it is suggested that the out-patient department should be retained, with possibly a surgical ward and theatre for emergency or accident cases. The sum of £500,000 is suggested as the approximate cost of the proposed buildings at Elm Park. The other hospitals concerned in the scheme of development are not likely to let the grass grow under their feet now that St. Vincent's has made a start.

The funds accruing to the Hospitals Trust Fund from the sweepstake conducted this week came to just over £500,000. For the last five sweepstakes the hospital receipts have been stabilised near this figure. The total receipts up to the present from the establishment of the sweepstakes in 1930 amount to just over £12,000,000.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 12TH, 1938

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2515; diphtheria, 1492; enteric fever, 17 (29 "expected"); pneumonia (primary or influenzal), 1430; puerperal pyrexia, 181; cerebro-spinal fever, 40; acute poliomyelitis, 4; encephalitis lethargica, 5; dysentery, 142; ophthalmia neonatorum, 114. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 18th was 5526, which included: Scarlet fever, 830; diphtheria, 1211 (carriers 44); measles, 2079; whooping-cough, 271; puerperal fever, 21 mothers (plus 14 babies); encephalitis lethargica, 282; poliomyelitis, 0. At St. Margaret's Hospital there were 32 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In 125 great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 55 (13) from measles, 6 (0) from scarlet fever, 14 (3) from whooping-cough, 40 (5) from diphtheria, 50 (17) from diarrhœa and enteritis under two years, and 76 (12) from influenza. The figures in parentheses are those for London itself.

Leicester reported the only death from typhoid. Liverpool had 7 fatal cases of measles, Dewsbury and Manchester each 3. Birkenhead and Liverpool each reported 3 deaths from whooping-cough. Diphtheria was fatal in 25 great towns; Liverpool reported 7 deaths, South Shields 3.

The number of stillbirths notified during the week was 270 (corresponding to a rate of 38 per 1000 total births), including 55 in London.

THE LANCET 100 YEARS AGO

March 24th, 1838, p. 929.

From a lecture on the nervous system delivered by Dr. Marshall Hall at the Theatre of Anatomy and Medicine, Webb-street, Southwark.

OF MANIA

THERE is still much obscurity in our views of this sad but interesting subject.

The most important consideration in regard to the *causes* of mania is, undoubtedly, hereditary predisposition. The most powerful of exciting causes is mental harass; the arduous duties of our prime ministers, the anxieties of the Stock Exchange, have frequently led to mania in its worst forms. . . .

Mania, when it does occur, assumes various forms; it is sometimes attended by an expression of the eye and of the countenance, a manner, a demeanour, a loquacity, which denote the utmost excitement; in other cases it is moping, melancholy, with a corresponding attitude and taciturnity; in a third instance there is a monomaniacal disposition to suicide or homicide; in a fourth patient we may have nymphomania.

The first symptom is frequently wakefulness. Never neglect this symptom. . . .

Then some incoherent idea is expressed; love is changed into hatred; friends are viewed as enemies; prosperity as ruin; there are suspicions of a thousand kinds; despondency, or absolute despair. . . .

An important question is that which relates to the morbid anatomy: is this *cause* or *effect* of mania? . . . I fear this point has not been sufficiently considered by those who have addicted themselves to this department of medical science. It is sad to observe how a little effusion, a slight layer of lymph, is the *cause* of everything in the minds of some of these gentlemen of one idea.

CORRESPONDENCE

OUR COLLEAGUES IN AUSTRIA

To the Editor of THE LANCET

SIR,—In view of recent events, we the undersigned members of the medical profession desire to express our alarm at the possible fate of our colleagues in Austria. There are in that country many revered physicians and surgeons who are likely to fall into disfavour with the National Socialist Government either on account of their medical or social views or on account of their belonging to the Jewish race. Judging from what has happened in Germany in the past, we are afraid that serious discrimination will be exercised against them and that even the chance to leave a country which is no longer hospitable to them may be refused.

We beg our colleagues in all countries to watch the progress of events with the closest attention and to do all in their power, whether by public protest or by public or private assistance, to stand by any member of our profession who may suffer hardship under the new régime.

We are, Sir, yours faithfully,

(Signed) W. RUSSELL BRAIN, HORDER, W. MCADAM ECCLES, ALAN MONCRIEFF, ARTHUR ELLIS, J. P. MONKHOUSE, RICHARD W. B. ELLIS, E. P. POULTON, DAVID FORSYTH, H. E. ROAF, R. D. GILLESPIE, JOHN A. RYLE, DONALD HUNTER, ADRIAN STEPHEN, ARTHUR HURST, C. P. WILSON, ROBERT HUTCHISON, W. H. WYNN.

March 21st.

THROMBOSIS AND HEPARIN

To the Editor of THE LANCET

SIR,—I was most interested to read the two articles in your issue of March 19th on the treatment of thrombosis by heparin. Drs. Holmin and Ploman in reviewing a case of thrombosis of the central retinal vein state:

"It is hardly necessary to discuss the diagnosis, thrombus in the main trunk of the central vein of the retina. The sudden decrease in vision indicates a circulatory disturbance and the ophthalmoscopic finding is characteristic."

Surely it is just this question of diagnosis which requires the fullest discussion. If actual thrombosis of the central retinal vein had occurred it is difficult to believe that any amount of heparin would have been capable of restoring circulation in the manner which they describe. Repeated observation compels the conclusion that in those cases where vision returns either spontaneously or as a result of treatment no actual thrombosis can have occurred, and that the observable circulatory disturbance in its early stages, and in probably the majority of cases, must rather be attributed to obliteration of the lumen of the vessel either by local vaso-spasm or by œdema of surrounding tissues. The same argument must be true of so-called thrombosis in other vessels, as for example the cerebral or coronary arteries. In the presence of arterial disease subsequent thrombosis may occur extremely quickly, but it is often astonishing how long it may be delayed.

I well remember being called to see a lady of 72 with a very high blood pressure who for five days had been deeply unconscious with a left hemiplegia. I read the death sentence to a large gathering of relatives before administering my routine treatment of intensive amyl nitrite. Much to my astonishment and confusion the patient became semi-conscious in 10 minutes, was talking in half an hour, and was as well as ever in three days.

While subscribing to the value of heparin in the treatment of these conditions I submit that its principal value lies rather in the prevention of clot formation in a stagnant circulation and only to a very much less extent in the inhibition of increment to a clot which has already formed (as in Dr. Magnusson's case). In other words I regard it as an auxiliary to, but by no means a substitute for, existing lines of treatment which must still be directed at the urgent relief of the underlying vaso-spasm. That the latter measures by themselves were adequate, provided that the patient was seen in good time, is evident from my own small group of cases of "thrombosis" of the central retinal vein. Far from being "unique to witness the disappearance of hæmorrhages and the increase of vision to its normal value in so short a time as five to six weeks" I am led to believe that such a result should be anticipated with reasonable confidence in patients who report as early as the hospital nurse under review.

Finally I cannot refrain from hazarding the guess that the underlying vasomotor instability of both subjects is of climacteric origin. The nasal catarrh and unilateral grinding headache in the nurse aged 52 and the recent onset of mild diabetes in the neurological case aged 48 would strengthen this assumption. If this be so then further vascular crises can be predicted with reasonable certainty unless this tendency can be adequately controlled by the correct employment of œstrogenic substances.

I am, Sir, yours faithfully,

Manchester, March 21st. H. R. DONALD.

PURPURA FOLLOWING SEDORMID

To the Editor of THE LANCET

SIR,—I have seen, within the last few weeks, two cases of severe thrombocytopenic purpura following the use of Sedormid for insomnia. Both patients were middle aged; both had been taking sedormid each night unknown to their medical attendants, one for three months, the other for three weeks; both showed a profuse purpuric rash which involved the skin as well as the mucous membrane of the mouth; and both had severe bleeding from the kidneys. Both recovered quickly when the sedormid was withheld; no other treatment was used except a high calcium diet. Only in the first case were blood counts taken; these showed a progressive anæmia to 50 per cent. of normal and a drop in the platelet count to 80 per c.mm. Loewy described three such cases in your columns (*Lancet*, 1934, **1**, 845); but, as far as I can find, this is the only English reference to this condition, though Lieberherr (*Med. Klin.* 1937, **33**, 475) gives seven references to this allergo-toxic reaction. As sedormid, allyl-isopropyl-acetyl-carbamide, is usually considered to be non-toxic I think it is, perhaps, worth while reminding your readers that its use is not unattended by the danger of severe purpura developing in those who are susceptible to its action. I am, Sir, yours faithfully,

Wimpole-street, W., March 19th. JAMES TORRENS.

DIPHTHERIA—A PREVENTABLE DISEASE

To the Editor of THE LANCET

SIR,—Supplementing the recent communication (Feb. 12th, p. 391) under this heading by FitzGerald, Fraser, McKinnon, and Ross, the following additional information relating to notifications of cases of diphtheria in England and Wales and in Canada for the period August 28th, 1937, to Jan. 29th, 1938, is set out here. It will be seen that the incidence

DIPHTHERIA CASES REPORTED

Week ending.	England and Wales.		Canada.	
	Cases.	Rate per 100,000.	Cases.	Rate per 100,000.
1937.				
Aug. 28th	910	2·2	30	0·3
Sept. 4th	1084	2·7	58	0·5
„ 11th	1241	3·0	43	0·4
„ 18th	1308	3·2	81	0·7
„ 25th	1320	3·2	71	0·6
Oct. 2nd	1348	3·3	67	0·6
„ 9th	1451	3·5	80	0·7
„ 16th	1566	3·8	82	0·7
„ 23rd	1706	4·2	104	0·9
„ 30th	1694	4·1	106	0·9
Nov. 6th	1698	4·1	99	0·9
„ 13th	1750	4·3	117	1·1
„ 20th	1634	4·0	92	0·8
„ 27th	1830	4·5	120	1·1
Dec. 4th	1765	4·3	119	1·1
„ 11th	1683	4·1	92	0·8
„ 18th	1568	3·8	76	0·7
„ 25th	1291	3·2	73	0·7
1938.				
Jan. 1st	1417	3·5	77	0·7
„ 8th	1584	3·9	57	0·5
„ 15th	1659	4·1	78	0·7
„ 22nd	1737	4·3	74	0·7
„ 29th	1892	4·6	107	1·0

These rates are based on the estimated populations for 1936 :
England and Wales 40,839,000
Canada 11,014,000

of the disease is consistently four to five times greater in the former administrative area than in the latter. The widespread employment of diphtheria toxoid in vaccination against the disease in Canada would appear to be the only factor which can be held accountable for this difference.

I am, Sir, yours faithfully,

J. G. FITZGERALD,
Director, School of Hygiene and Connaught Laboratories, University of Toronto.

Feb. 26th.

ELECTROSURGICAL OBLITERATION OF THE GALL-BLADDER

To the Editor of THE LANCET

SIR,—I have read Dr. Thorek's paper on electrosurgical obliteration of the gall-bladder in THE LANCET of Jan. 1st and would like to make a few observations on it, especially as I have been asked from time to time to record in English my results with this method.

My experience with electrosurgery of the gall-bladder extends over more than 14 years. In 1924 I used a special high-power Paquelin cautery, but as soon as suitable apparatus for electrocoagulation was introduced I adopted this as having many technical advantages. In the following years I developed the technique and have now used it in more than a thousand cases. Many prominent surgeons tried the method after my first papers and Mirizzi, Jacobowici, Popp, and others reported favourably upon it. In 1932 I showed a cinema film of the operative details at the international congress at Vichy.

Thorek's paper seems to give the impression that the procedure he is describing is a new one. Such an impression would not, I think, be justified. It is not correct to speak of two different methods, for I used deep electrocoagulation for certain cases from the beginning (*Zbl. Chir.* 1929, **56**, 1054). The depth of electrosurgical destruction must depend on *individual conditions*. Where the inflammatory process is limited to the mucous membrane, destruction of the inner coats, leaving the serous coats intact, is quite sufficient, but the destruction must be thorough. When Thorek says that he observed regeneration of the mucous membrane he proves that he did not perform the operation according to my description. Popp, who saw the procedure in my clinic, had occasion to reopen the abdomen of a patient on whom he had done a correct mucoclasis some time previously and found only a small fibrous scar where the gall-bladder had been (*Zbl. Chir.* 1931). It is not in fact advisable to destroy the serous membrane in all cases, for it seldom contains active germs and its defensive properties make it an excellent protection for the more delicate tissues. It is much better to use the serous coats of the bladder, which never cause relapses from infection, than a free graft such as Thorek suggests, for in grafted tissue necrosis is very common—especially over a necrotised tissue where there is heavy infection. The source of "bacterial relapses" after cholecystectomy is usually the liver itself, which always harbours germs in the small bile-ducts, in the interstitial pericapillary tissue, and in the reticulo-endothelial cells. In my opinion a hepatitis always precedes recurrences. Where there is phlegmonous inflammation and abscess-formation the situation is entirely different. Here I advise the destruction not only of the whole gall-bladder but also of all abscesses deep in the liver parenchyma. Electrocoagulation is far the best method of treating liver abscesses in general.

Increasing experience leads one to realise more and more the importance of adapting one's procedure to each individual case. The gall-bladder is by no means a useless organ, but has definite functions, as recent research has clearly shown. For this reason I try, where its function is still good and the walls are not too much inflamed, to preserve the organ by performing a cholecysto-choledochostomy. I have performed this conservative operation in 32 cases, and other surgeons such as Schönbauer of Vienna can confirm its success. I understand that Thorek applies my radical electrocoagulation to all (even the most simple) cases, and this I personally regard as too rigid a procedure. Nevertheless I am very glad to hear of his excellent results, which prove that the method represents a valuable advance and confirm my statistics of ten years ago.

On the question of drainage Thorek mentions nearly all the points which I described as "the sins of drainage" (*Med. Klin.* 1928, **24**, 1147), when I advocated primary closure of the abdominal wall without drainage after mucoclasis. But there are exceptions in which it is advisable to insert a small rubber drain. This is not of course done to provide an exit for an undesired flow of bile, for such a flow does not occur with this technique. After all operations, however, products of damaged tissue, especially amines, remain in the field and affect the peripheral circulation and lower the blood pressure. When we close the abdominal cavity completely in cases where the operation field is not absolutely dry, and all the organs are not covered with serous tissue, these products are reabsorbed and carried by a centrifugal

flow of lymph into the circulation. If, on the other hand, we put a foreign body such as a rubber drain into the abdominal cavity after the operation the local irritation of this foreign body causes (as can be shown experimentally) a reversal of the lymph stream and reabsorption is checked. This is why I do not advise primary closure where there is extensive necrosis and destruction of the serous membranes, as in infections with *Bacillus coli*.

To summarise: (1) The technique of, and indications for, electrosurgical destruction of the gall-bladder have been developed exhaustively since 1924 by my co-workers and myself. (2) In the majority of the thousand cases treated, destruction of the gall-bladder (mucoclasis) with preservation of the serous membranes has proved the most satisfactory procedure. Where the function of the gall-bladder is still good and exploration shows only stones without severe inflammation of the walls we prefer to preserve the whole gall-bladder and perform a cholecysto-choledochostomy. (3) In cases of phlegmonous inflammation with abscess-formation total destruction of all the coats of the gall-bladder by electrocoagulation may be necessary. Careful destruction of all abscesses deep in the liver is of the greatest importance. (4) No rigid procedure is advisable, but the depth of electrocoagulation must be adapted to special cases. (5) Usually no drainage is required after electrocoagulation, but in cases badly infected, especially with *B. coli*, a drain will act as a foreign body and reverse the lymph stream, thus preventing too quick a reabsorption of toxic products. (6) Electrosurgical operations on the gall-bladder have considerably lowered the mortality and shortened the time of recovery.

I am, Sir, yours faithfully,

B. O. PRIBRAM,
Director, Surgical Department, St. Hildegard Hospital, Berlin.

March 14th.

HOSPITAL LIBRARIES ABROAD

To the Editor of THE LANCET

SIR,—In various official capacities it has fallen to my lot to collect information about hospital libraries in all countries in which they exist, and I cannot agree with your statement (Feb. 12th, p. 414) that the value of books to patients has not received the same recognition in this country as in some others. Actually it has received more, but here the *method* of establishing the libraries has been different. There is, I think, no country in the world in which so many of *every* type of hospital (with the exception of some of the infectious hospitals) is supplied with books—over 2000 hospitals in all. The large majority of these are supplied by the British Red Cross Society and Order of St. John Hospital Library, and the remainder by the Library Association, Toc H, or by individual hospitals themselves. These three organisations are in close coöperation with each other. Amongst these hospitals an increasing number have librarians, most of whom are voluntary, but wherever possible tuition, at a training centre and failing that in writing, is given to the head librarians.

Where a library service has developed as quickly over a national field the standard cannot be as uniformly high as it is where libraries are opened up slowly, hospital by hospital. Reports of American hospital libraries show that many of them are excellent; some have new, others second-hand books; some have professional, others voluntary librarians. Some of the libraries in the Paris hospitals are a joy to see; they have been able to acquire special funds for the purpose.

The immediate problem is where in countries where most of the hospitals are municipal, magnificent libraries such as those in France and America (and also Brussels) can be developed and maintained for all hospitals within a reasonable period of time. And the question arises whether it is better to leave many thousands of hospital patients without books at all until first-class libraries can be started; or to try, by some means or other, to provide books for all hospitals quickly, and then to set about improving the standard. The International Guild of Hospital Librarians advocates the latter method—provided always that second-hand books are in good clean condition—and it is fair to recall that in some countries the hospital library movement owes its activity to the efforts of the Guild. Once hospital and public library authorities regard libraries for patients as *essential* the rest will follow, each country working out a plan best suited to its needs.

I am, Sir, yours faithfully,

MARJORIE E. ROBERTS,
Hon. Secretary, International Guild of Hospital Librarians.

48, Queen's-gardens, W.2, March 22nd.

A RECTAL PLUG FOR PILES

To the Editor of THE LANCET

SIR,—In reply to Dr. Poulton the rectal plug which I described in your issue of Jan. 15th was made by Messrs. Down Bros., and is similar to his, but has a smaller end. My next step has been to ask a firm to make a plaster impregnated with a substance with delayed melting properties in which is incorporated 2 per cent. of silver nitrate for its sclerosing action on the hæmorrhoidal sinus. This plaster is applied around the neck of the plug and can be renewed as often as necessary. Thus we have a continuous medicinal therapy to an area impossible to treat by unguenta, along with continuous pressure exerted by the anal sphincter on the hard neck of the plug. Together this may help to solve a distressing and difficult problem. I am, Sir, yours faithfully,

Hastings, March 21st. E. F. ST. JOHN LYBURN.

A FACTOR IN FLATULENCE

To the Editor of THE LANCET

SIR,—In his remarks on flatulence reported in THE LANCET of March 5th (p. 553) Prof. Henry Cohen omitted the mention of what must surely be the most important factor, at any rate as far as the intestine is concerned. If carbon dioxide is produced by the neutralisation of a carbonate and hydrochloric acid and this gas gets inside the intestine, or if the carbon dioxide results from fermentation in the intestine, the latter must act as an aerotonometer so that nitrogen and oxygen diffuse into it from the tissues until there is approximate equilibrium, in other words until the mixed gases contain about 7 per cent. carbon dioxide, 5 per cent. oxygen, and 88 per cent. nitrogen,[1] a sevenfold increase of volume. The principle is of course the same as the change which takes place in a pneumothorax after the introduction of air, and would not require more than two or three hours. The reabsorption of the mixed gases will then depend upon their total pressure in the intestine being greater than their total pressure in the tissues, and since nitrogen diffuses more slowly than the other gases, owing to its low solubility and the

[1] Campbell, J. Argyll, and Poulton, E. P., Oxygen and Carbon Dioxide Therapy, London. 1934. Fig. 3, p. 10, and addendum, p. 190.

high concentration in the atmosphere, the reabsorption will mainly depend on the rate at which this gas disappears. This change in the composition of a gas associated with the slowing down of absorption has been called by Krogh "a sliding equilibrium." Its rate is eventually as slow as after an artificial pneumothorax, but would be facilitated if the patient was placed in a reasonably air-tight oxygen tent with a high percentage of oxygen, because the nitrogen would more rapidly diffuse out through the pulmonary epithelium into the air of the tent. Mr. Zachary Cope himself referred to this work of J. Fine and his co-workers. This method ought to be tried more often, especially after surgical operation.

I am, Sir, yours faithfully,

E. P. POULTON.

Upper Wimpole-street, W., March 21st.

HEARING-AIDS FOR DEAFNESS

To the Editor of THE LANCET

SIR,—As one who has suffered from a gradually increasing deafness of the middle-ear type for the past twelve years I would like to put at the disposal of my colleagues my experiences with various hearing aids. I propose referring to the degree of deafness in three stages, together with the measure of relief afforded by certain aids.

Ten years ago the deafness was only noticeable when conversation was kept low, and when the hearing conditions of a hall or theatre were poor. I would not recommend any aid for this stage.

Six years ago ordinary conversation had to be clear to be heard, and at meetings I had to obtain a seat near the speaker. I tried various electrical aids and found them useless. A six-inch Banjo trumpet was of real help at lectures. For this stage the simple electrical aid would probably be the instrument of choice to-day.

At the present time I can only hear conversation at five feet if the speaker raises his voice considerably. I can just manage the telephone if the line is good. All ordinary undertakings are handicapped by the obvious fact that one is "very deaf." When I had reached this stage the simple electrical aid gave me comparatively little assistance, and I was becoming resigned to the inevitable, when I was given an opportunity of trying a valve aid last summer. To my astonishment I found that I could hear all ordinary quiet conversation, and that at meetings and dinners auditory conditions had to be very bad if I was unable to hear distinctly.

I tested a number of different makes, fitted with both carbon and crystal microphones, all except one having an air-conduction receiver. In every case I could hear well, but there was considerable variation in the pleasantness of the tone, especially in music. The one exception was arranged for bone conduction, and I found that I could hear slightly better with this aid than with any of the others that I tested; further, the reception was particularly pleasant. This model was recently introduced to this country by an American firm, and is of the size and shape of a postcard roll film camera. I have worn this aid every day for the past three months, and have experienced none of the uncomfortable pressure effect referred to in a report issued by the Medical Research Council on the testing of hearing aids.[1] I understand, however, that there was no satisfactory valve aid fitted with bone conduction on the market at the time this report was drawn up. When laboratory tests can be made between valve aids with bone conduction and valve aids with air conduction, it seems likely that the value of bone conduction as a system of hearing may prove to be greater than previous tests indicated.

In conclusion, I would quote the old saying that the proof of the pudding is in the eating. Never allow anyone to purchase an aid until he has had an opportunity of testing it fully, under the conditions which usually occasion the greatest difficulty in hearing.

I am, Sir, yours faithfully,

Ipswich, March 15th. C. H. C. DALTON.

[1] *Spec. Rep. Ser. med. Res. Coun., Lond.* No. 219, iv.

OBITUARY

ARCHIBALD WILLIAM CUFF, M.B. Camb., F.R.C.S. Eng.

Mr. Archibald Cuff, who died on March 9th at the age of 69, after a long illness, received his professional education at Cambridge and St. Thomas's Hospital. In 1895 he was appointed house physician to the Sheffield Royal Infirmary and in 1898 joined Dr. G. E. K. Thorpe in his practice in Sheffield. Later he became honorary surgeon to the Royal Infirmary and during his 30 years there helped to lay the foundation of modern abdominal surgery. On his retirement he was elected to the board of management. He was a sound and reliable surgeon, calm and deliberate, and opposed to adventurous and ill-digested methods. He was an omnivorous reader and among his many-sided interests included conjuring, painting in water colours, and the collection of china and glass. He was lecturer in surgery at Sheffield University and an examiner at Cambridge, and during the war served as medical officer with the R.F.A. on the western front. He leaves a widow and two daughters.

THE LATE SIR RAYMOND CRAWFURD

Dr. Charles Newman writes: "Many men of this, and probably of preceding, generations will find they have lost a very great friend in Sir Raymond Crawfurd. He was one of those exceptional people who are not only ready at any time to give advice and assistance to those who ask it; he went out of his way to seek opportunities to be of use to others. He once said that the reason he enjoyed teaching medicine was that it gave so many occasions for helping students, especially the average man, who could benefit so enormously from that kind of assistance, of which the brilliant student stood in no such need. This attitude was strongly expressed in his teaching: he had a genius for teaching the simple and important things, which so many make dull and tedious, in an interesting and intelligible way. . . .

"He was very like Thomas Hardy in his attitude to human failings. Beneath his interest in the foibles and weakness of his fellows there lay, not a feeling of superiority or of scorn, but a kindly pitying tolerance and a great humour. Without some degree of acquaintance, it was easy not to appreciate that this dignity and meticulous scholarship were mixed with many other qualities: a great love of the countryside, of birds and of all natural beauty, a delicate sensitivity to ugliness of all kinds, and that excitement about football which ultimately cost him his life. Those who came to know him were often surprised by the youthful receptiveness of Sir Raymond Crawfurd's mind; his willingness to consider with sympathy any idea, however new. Everyone appreciated his

(*Continued at foot of opposite page*)

PARLIAMENTARY INTELLIGENCE

THE INFANTICIDE BILL

LORD DAWSON'S PROPOSALS

IN the House of Lords on March 22nd Viscount DAWSON OF PENN moved the second reading of the Infanticide Bill. Its intention, he said, was to secure recognition by Parliament that in certain circumstances the killing of infants was provoked by illness and not always by criminal intent, and to procure for such cases appropriate handling. The subject had vexed the minds of both lawyers and the public for 70 years. The common sense of the public had detected that among these cases of child murder there were two groups: a childbirth group and a group which constituted the murdering of unwanted children. Yet both were tried for murder and condemned to death alike. In course of time public feeling became so moved that juries refused to convict, and that led to a certain number of guilty people escaping punishment for murder.

In 1861 a Bill was passed which provided a loophole and created the offence of concealment of birth. Then juries got out of their difficulties by finding the defendants innocent of murder but guilty of concealment of childbirth, with the result that a number of people escaped who ought not to have done so. Finally, in 1909, a Bill was passed through the House of Lords, of which Lord James of Hereford was the substantial author, which provided that should a judge think proper he could direct the jury to acquit the woman of murder and to convict her of manslaughter, the sentence being left to the judge. In 1922 a more far-seeing measure was brought forward by the late Mr. Arthur Henderson, which after amendment in the House of Lords, became the Infanticide Act of 1922. That Act provided that in cases where at the time a mother caused the death of her child she had not fully recovered from the effects of giving birth to a child and the balance of her mind was thereby disturbed she would be guilty of manslaughter. But there was no definition in that Act of what was meant by a "newly born" child.

The hardship of these cases was that women, who were in many instances innocent, might be faced with the prospect either of being convicted of murder or of being sent to Broadmoor and of being stamped with insanity. The term "newly born" had been omitted from the present Bill and a time limit of a year had been inserted. The Bill gave a jury power to bring in a verdict of infanticide on their own initiative. When a defendant appeared in a court of first instance it was neither fair nor necessary that she should be remanded to prison. Where possible bail should be allowed, but where that was not possible the woman should be remanded to a hospital or to a home. In a large proportion of these cases there was a complete recovery. Forty-two per cent. of the female admissions to Broadmoor were there for child destruction, and of these 50 per cent. recovered. It was an unfortunate thing that those women should have the Broadmoor stamp; they should be treated as cases of illness.

It was necessary, Lord Dawson agreed, to be careful that a means of escape was not provided for the murderer of the unwanted child and it was for that reason that he had inserted the limitation of one year. It was rare to find cases of insanity following childbirth which did not recover within a year. The Bill implied that certain offences could be due to mental illness, and when that illness amounted to irresponsibility for the offences charged the patient should neither be punished nor dubbed as a lunatic but should be bound over for appropriate treatment. It would be a practice more in harmony with present-day thinking and sound humanity.

GENERAL SUPPORT

Lord SNELL said that the Labour peers gave the Bill their general support, but if one of these women was to be sent to a hospital they wanted to know what sort of hospital it should be. A criminal lunatic asylum, of course, was not the right place; nor was a mental hospital. It was true that in a mental hospital a patient had the advantage of specialised treatment, but sometimes some kind of certification was necessary. Certification of insanity should not be carried out if it could be avoided.—The Marquess of CREWE, in supporting the Bill, said that no doubt the points raised by Lord Snell would receive full attention in Committee? Support for the Bill was also expressed by Lord ATKIN and the Archbishop of CANTERBURY.—Lord ARNOLD suggested that consideration should be given to the extension of the Bill to cover cases where there was mental disturbance due to distress and despair arising from solicitude for the child, or extreme poverty, or either of these.

THE GOVERNMENT'S HESITATION

The Earl of MUNSTER, Lord-in-Waiting, said the term "newly born" had been criticised on the ground that it was indefinite. In cases where a verdict of infanticide was returned the death of the child generally occurred within the first few hours of birth, and he was advised that the courts had had no difficulty in interpreting the term. The question for how long a period childbirth might have a disturbing effect on the woman's mental balance was a medical question; in exceptional cases the effects might be long and possibly lasting. But in practice it was necessary to have regard to what was normal and unless the Bill was framed to deal with exceptional cases was it right, he asked, to fix the period at twelve months? Would not some shorter period cover the generality of cases? The result of fixing the period at all would be that in one case a woman would be liable to be convicted of murder because the child was just over the age-limit, and in another she would be convicted of infanticide because the child was just under the age-limit. How far would the substitution of a time-limit of twelve months for the term "newly born" result in an increase in the number of verdicts of infanticide? Since 1930 there had, he said, been 13 women reprieved after conviction for child murder. One killed an imbecile son aged 30, and one a daughter aged 8. Four killed children whose ages ranged from 12 to 20 months. In six of those cases the Bill would have had no effect whatever. In the case of the seven remaining women who killed children ranging from 1 to 9 months old there had been no suggestion that the mother's mind was still unbalanced by the effects of childbirth. This did not suggest that the effect of this Bill would be to substitute verdicts of infanticide for verdicts of murder in any considerable number of cases. The Government would however be prepared to give the Bill careful consideration in committee.

Lord DAWSON said that when this question was first brought up after a very painful case at the Central Criminal Court, he did not go into the matter in his personal capacity but took care, as president of the Royal College of Physicians, to refer it to a committee of experts. The conclusions he had put forward were their considered opinion. When their report was in his hands he brought it to a gathering of leading K.C.s and medical men, and there was

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(*Continued from previous page*)

ripe wisdom, the product of a fine mind endowed with many years of experience. He was a great registrar of the College of Physicians, and many of us will never enter the censors' room without thinking of him; the room which he said was the most beautiful in London, quiet yet in the hub of the capital, with its panelled walls and fine portraits, where from his seat he could see nothing, within or without, less than 100 years old."

general agreement about it. Infanticide, happily, was not a common thing. The Bill dealt with quality rather than quantity. He was aware of the figures which Lord Munster had quoted, but he was assured that cases of insanity delayed until the period of lactation were far more numerous than he had imagined.

The Bill was read a second time.

NOTES ON CURRENT TOPICS

Naval Marriage Allowances

IN the House of Commons on March 14th Mr. SHAKESPEARE, Parliamentary Secretary to the Admiralty, announced that a scheme of marriage allowances to officers of the Royal Navy and Royal Marines had been approved to operate from April 1st next. On introducing the Navy Estimates for 1938 on March 17th Mr. SHAKESPEARE said that it had been found necessary to reserve for further consideration the applicability of the present scheme of marriage allowance, with or without special modification, to the medical branch. He fully sympathised with the natural disappointment which all R.N. medical officers would experience when they heard that statement, but every effort was being made to arrive at an equitable arrangement at a very early date.

In the House of Lords on March 16th the Poor Law Amendment (No. 2) Bill was read the third time and passed. On March 17th in the House of Lords the National Health Insurance (Amendment) and Superannuation (Various Services) Bills passed through committee. A motion was agreed to referring the Collecting Charities (Regulations) Bill to a committee of both Houses. On March 18th the Housing (Financial Provisions) Bill passed through its remaining stages in the House of Commons and was read a first time in the House of Lords.

In the House of Lords on March 21st the Middlesex Hospital Bill was read a second time.—On March 22nd the National Health Insurance (Amendment) Bill was read the third time and passed. The Housing (Financial Provisions) Bill was read a second time.

QUESTION TIME

WEDNESDAY, MARCH 16TH

Deaths on a Liner

Mr. TEMPLE MORRIS asked the President of the Board of Trade whether any report had been received by his department as to the cause of the recent deaths on board the liner *Llanstephan Castle*.—Captain WALLACE, Parliamentary Secretary to the Board of Trade, replied: Yes, Sir. Three members of the crew are certified to have died in Port Sudan hospital on Feb. 13th, 14th, and 16th of malignant malaria. Another member of the crew died on board the vessel on Feb. 8th and the primary cause of his death is stated in the log to have been amœbic dysentery. As a result of his inquiry into this death, the superintendent of the Mercantile Marine Office has endorsed the log to the effect that there is not sufficient evidence available to enable him to say whether the statement of the cause of death in the log is in his opinion true or not.

Nutrition in Ceylon

Mr. SORENSEN asked the Secretary of State for the Colonies whether he was aware of the recent report on nutrition in Ceylon; and what action was being taken to improve nutrition and diminish mortality and ill health.—Mr. ORMSBY-GORE replied: Yes, Sir; two reports on this important subject have been published in the last year. As regards the second part of the question, it would be impossible to compress within the limits of a parliamentary answer the measures which are being taken by Ceylon ministers to improve nutrition. But as an instance of the great importance which I know ministers in Ceylon attach to the subject (it is one which under the constitution falls wholly within their competence) I may add that a sum of Rs.1,000,000 has been voted this year for providing meals for school-children.

Mr. T. WILLIAMS: Is the right hon. gentleman aware that it was generally the opinion of medical officers in Ceylon that the absence of resistance when the malaria epidemic overtook them trebled the death-rate.

Mr. ORMSBY-GORE: That certainly was the opinion expressed by a great many medical officers. No doubt this is a matter which the responsible ministers in Ceylon take into account.

Pay Deductions for Hospital Funds

Mr. ROBERT GIBSON asked the Secretary to the Treasury if the decision of the Admiralty under which Admiralty industrial employees not covered by existing contributory schemes might arrange for contributions to local hospital funds by means of deductions from their pay was to be extended to all industrial employees of the Government; and, if so, what services would be affected and how many workers in each service.—Colonel COLVILLE replied: The intention is that the scheme of deductions from pay for hospital purposes through a central organisation should be made available to all industrial staffs at home directly employed by the Government provided, of course, that the bodies to whom contributions are desired to be made elect to coöperate with the central organisation. As the hon. Member will appreciate, time may be taken in setting up the necessary machinery, the details of which are under discussion with the British Hospitals Contributory Schemes Association. The number of industrial employees of Government Departments on April 1st, 1937, was 173,000.

THURSDAY, MARCH 17TH

Hospitals and Air-raid Precautions

Colonel NATHAN asked the Home Secretary what directions it was proposed to issue, and when, for the information of the main hospitals and the special hospitals in London as to what steps they should take for the protection of their patients, staff, and buildings against injury by air-raids, and as to what was expected of them, respectively, in the event of an air-raid.

Mr. GEOFFREY LLOYD, Under-Secretary, Home Office, replied: This matter presents difficult problems. As regards the first part of the question a handbook on such structural precautions as are practicable is in an advanced stage of preparation and will be available shortly. On the last part, a survey of the position of the hospitals in London is being made by the Ministry of Health and the medical authorities.

Colonel NATHAN: Is the hon. gentleman able to say what the committees of hospitals, which at present are completely without information and quite unable to obtain guidance, should do to discharge their responsibilities towards their patients and their staffs?

Mr. LLOYD: This handbook will be available shortly, and in the meantime we shall be glad to advise any hospitals.

Mr. KELLY: Does that survey include mental hospitals as well as general hospitals?

No further answer was given.

Commitment of Children to Prison

Mr. HARVEY asked the Home Secretary what action was taken in the case of the 15 boys and three girls who were received into prison in 1936 without any certificate of the court, in accordance with the provisions of the Children and Young Persons Act of 1933; and whether he would issue instructions that in future no boys and girls under 17 years were to be received into prison without such a certificate in each case.—Sir SAMUEL HOARE replied: Prison Governors have instructions to bring any such cases immediately to my notice. In three of these eighteen cases the court was prepared to issue the necessary certificate; two cases were girls who reached the age of 17 while on remand; in nine cases the period of remand was so short (in some cases for one night only) that no action could be taken; in the remaining four cases three boys and one girl were removed to Remand Homes. As regards seven of the eighteen cases five boys and two girls had told the court that they were over 17 and their true ages were not discovered till after they had been received into prison.

Mr. HARVEY: Can instructions be given to governors

of prisons to refer cases of this kind to remand homes when they know the ages of the children concerned?

Sir S. HOARE: Yes, Sir. Due instructions are being issued to prison governors that they are not in future to receive anybody under the age of 17 into the prison unless the document accompanying the prisoner authorises them to do so.

Physical Training and Recreation

Sir SMEDLEY CROOKE asked the Parliamentary Secretary to the Board of Education what action had been taken by the National Advisory Council for Physical Fitness to carry out the Government's declaration that the Physical Training and Recreation Act was designed to help those who were desirous of obtaining facilities for physical exercise but who were not well off and without initiative; and what inquiries had been made amongst members of junior football clubs, or similar small athletic clubs, to ascertain their desires and supply their wants.—Mr. KENNETH LINDSAY replied: In considering applications for grant, and in assessing the amount of grant, in aid of facilities to be paid by the Board, the Grants Committee invariably pay close attention to the economic circumstances of the area or of the particular applicant organisation. As regards the second part of the question it is one of the statutory functions of area committees to review the existing facilities and to survey the needs of their areas and my noble friend has no doubt that in the course of this survey clubs and organisations of every sort will have ample opportunity of making known their own particular needs.

Flooded Houses in Norfolk

Sir THOMAS COOK asked the Minister of Health what steps were taken by the local authority to ensure that its medical officer of health inspected property which was inundated as the result of the recent abnormal high tide in the parish of Cley, Norfolk; when was the visit made; and what was the result of the report received.—Sir KINGSLEY WOOD replied: I understand that the medical officer of health visited Cley on Feb. 14th immediately after the flood water had subsided. Neither he nor the sanitary inspector, who subsequently visited the village on several occasions, found any reason to suspect any danger to public health.

MONDAY, MARCH 21ST

Where People Die

Mr. RHYS DAVIES asked the Minister of Health the proportion of persons who died at their own homes in this country and those in institutions, respectively.—Sir KINGSLEY WOOD replied: The latest information available is that published in Appendix B of the Registrar-General's statistical review, Part I, for the year 1930, which shows the aggregated figures for the years 1926–30. The figures and percentages are as follow:—

Deaths by place of occurrence, England and Wales 1926–30.

	No. of deaths.	Per cent.
Deaths in institutions	780,529	32·7
Deaths elsewhere than in institutions	1,606,192	67·3
	2,386,731	100·0

Vaccination

Mr. GROVES asked the Minister of Health if he would supply the following particulars for each of the last five years for which complete figures were at present available: the number of public vaccinations and revaccinations; the expenditure of local authorities on vaccination; and the expenditure on the Government lymph establishment.—Sir KINGSLEY WOOD replied: The information desired by the hon. Member is as follows:—

1. Public vaccinations and revaccinations (England and Wales):

Year ended—Sept. 30th	Public vaccinations.	Revaccinations.
1932	207,543	16,624
1933	189,857	9,628
1934	184,137	14,802
1935	183,917	9,267
1936	176,618	11,434

2. Net expenditure on vaccination of all local authorities (England and Wales):

1931–32	£146,714	1934–35	£125,646
1932–33	£136,365	1935–36	£126,775
1933–34	£128,339		

3. Net expenditure of Government lymph establishment:

1932–33	£12,583	1935–36	£12,363
1933–34	£11,752	1936–37	£12,069
1934–35	£11,492		

TUESDAY, MARCH 22ND

Compulsory Notification of Measles

Mr. DAY asked the Minister of Health whether his attention had been drawn to the fact that, during the ten years from 1927 to 1936, there was an annual average of 527 deaths from measles in London alone; and, with a view to preventing any infectious disease becoming widespread, would he utilise his powers under the Public Health Act, 1936, to make regulations rendering all cases of measles compulsorily notifiable on a uniform basis.—Sir KINGSLEY WOOD replied: The answer to the first part of the question is in the affirmative. With regard to the last part, this matter has recently been under consideration by the London County Council and I have informed them that I should be prepared to entertain an application for the making of regulations in regard to the notification of measles in London.

Vermin in Ships

Sir WALTER SMILES asked the Minister of Health how many British steamers inspected by the Cardiff port sanitary authority during the past year were found to be vermin-ridden.—Sir KINGSLEY WOOD replied: I am informed by the port health authority that the number was 114.

Births, Marriages, and Deaths

BIRTHS

FOX.—On March 16th, at Hove, the wife of Dr. Frank W. W. Fox, Colonial Medical Service, Nigeria—a son.

PASMORE.—On March 18th, at Chepstow Villas, W., to Dr. Jean and Dr. Stephen Pasmore—a daughter.

WILLIAMS.—On March 16th, the wife of Mr. H. Morgan Williams, F.R.C.S., of Parkstone—a daughter.

MARRIAGES

LEECH—JACKSON.—On March 19th, at William Parish Church, Letchworth, Ralph Bosdin Leech, M.R.C.S., of Sevenoaks, to Bertha Newsom Jackson, of Letchworth.

MACGREGOR—SIMPSON.—On March 19th, at Holy Trinity, St. Marylebone, Dr. Murdoch MacGregor, of Exeter, to Lilian Simpson, of The White House, Regent's Park.

DEATHS

BAILEY.—On March 18th, R. Cozens Bailey, M.S. Lond., F.R.C.S. Eng., of Hazelwood, East Cowes, aged 70.

BENSLEY.—On March 16th, at Cookham Dean, Lieut.-Colonel Charles Norman Bensley, M.B., C.M. Edin., I.M.S. (retd.), aged 74.

BIRT.—On March 18th, at Sydenham, Colonel Cecil Birt, M.R.C.S. Eng., A.M.S. (retd.), aged 78, the last surviving child of the late Dr. Thomas Birt, of Leamington Spa.

CLOGG.—On March 17th, at Nuffield House, Guy's Hospital, Arthur Henry Clogg, L.D.S. R.C.S. Eng., of Upper Norwood and Harley-street.

GIBBS-SMITH.—On March 15th, Edward G. Gibbs-Smith, M.D. Durh., D.P.H., of South Kensington.

GRIFFIN.—On March 17th, at Southampton, Frederick Thresher Griffin, M.B., C.M. Edin.

KINGSBURY.—On March 14th, at Blackheath, George Chadwick Kingsbury, M.D. Dubl., barrister-at-law.

PHILLIPS.—On March 21st, John Robert Parry Phillips, O.B.E., M.R.C.S. Eng., of Kingsdown, Box, Wiltshire.

QUAYLE.—On March 16th, at Budleigh Salterton, William Adair Quayle, M.D. R.U.I., Colonel, I.M.S. (retd.), aged 82.

ROSE.—On March 21st, at The Woolavington Wing, Middlesex Hospital, Thomas Rose, M.R.C.S. Eng., in his 67th year.

TOLAND.—On March 14th, Charles Kirk Toland, M.D. Glasg., of Ullesthorpe, Rugby, aged 63.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

MEDICAL NEWS

University of Oxford

Mr. G. R. Girdlestone, Nuffield professor of orthopædic surgery, has been elected to a supernumerary fellowship at New College.

University of London

At the second annual conversazione, held on March 17th, graduates and their friends took the opportunity of seeing progress in the building scheme. Guests entered through the base of the tower which was flood-lighted but not otherwise accessible, and the libraries on the fourth floor were part of the exhibit. During the evening members of the administrative staff twice performed an abbreviated version of a musical play in five acts entitled "A China Rose," and serious musical entertainment was provided by students of Trinity College of Music.

University of Sheffield

At recent examinations the following candidates were successful :—

FINAL EXAMINATION FOR THE DEGREES OF M.B., CH.B.

Parts II and III.—G. E. Wright (with second class honours), A. K. Beardshaw, R. B. Davies, H. D. Elliott, W. L. Rose, and J. W. Wier.

University of Liverpool

At recent examinations the following candidates were successful :—

D.M.R.E.

Part A.—G. E. Church, N. A. Lawler, W. Niven, and F. Pygott.

D.P.H.

Part I.—S. Ball, A. Cathcart, A. B. Concanon, L. R. L. Edwards, A. J. Gill, A. L. Smallwood, and Margaret C. Winter.

D.T.M.

F. Bastawros, P. J. Bourke, O. Einstein, N. Q. Hesse, F. Jacusiel, K. Jilani, J. Kay, E. Kohlschütter, J. L. Lanceley, and B. Nyan.

D.T.H.

J. L. Dales and V. G. Patwardhan.

Dr. J. Kay was recommended for the Milne medal.

Congress of Thalassotherapy

The International Association of Thalassotherapy will hold its eighth congress at Montpellier-Palavas from June 3rd to 6th. The principal subjects for discussion will be tuberculous peritonitis, and the meteorological factors of the sea climate. Further information may be had from the secretary of the association, 8 rue André Michel, Montpellier, France.

Royal Society

The following have been elected to the fellowship of the society : G. D. Bengough, consultant to the chemical research laboratory, Department of Scientific and Industrial Research ; C. H. Best, professor of physiology, University of Toronto ; W. Brown, professor of plant pathology, Imperial College of Science and Technology ; J. W. Cook, professor of chemistry, the research institute, Royal Cancer Hospital ; T. L. Eckersley, research physicist, Marconi's Wireless Telegraph Company ; G. I. Finch, professor of applied physical chemistry, Imperial College of Science and Technology ; W. E. Gye, director of the laboratories of the Imperial Cancer Research Fund ; W. V. D. Hodge, Lowndean professor of astronomy and geometry, University of Cambridge ; J. S. Huxley, secretary of the Zoological Society of London ; J. Jackson, H.M. Astronomer at the Cape ; Sir Robert Mond, chemist and Egyptologist ; J. E. Richey, district surveyor, H.M. Geological Survey ; F. S. Russell, naturalist at the Marine Biological Association ; B. F. J. Schonland, professor of physics, University of Cape Town ; F. S. Sinnatt, director of fuel research, Department of Scientific and Industrial Research ; K. M. Smith, senior research assistant, Plant Virus Station, Cambridge ; E. Stedman, lecturer in department of chemistry in relation to medicine, University of Edinburgh ; C. E. Tilley, professor of mineralogy and petrology, University of Cambridge ; W. E. S. Turner, professor of glass technology, University of Sheffield ; and H. H. Woollard, professor of anatomy, University College, London.

THE King has given Dr. Hugh Stannus, senior physician to the French Hospital, London, permission to wear the insignia of Chevalier Legion d'honeur conferred upon him by the French Government.

North-Western Tuberculosis Society

Mr. J. E. H. Roberts will read a paper in the physiology theatre of the medical school of Manchester University, on Thursday, March 31st, at 3.15 P.M., on the surgical treatment of pulmonary cavities. Medical practitioners are invited to attend.

St. Mary's Hospital

Under the will of Mr. Frank Lindo, who as an "anonymous donor" gave generously to the hospital during his lifetime, his house and gardens at Adair Lodge, Aldeburgh, will now pass to the hospital as a rest and convalescent home for its nurses. Mr. Lindo also bequeathed the sum of £25,000 for the upkeep of the home.

West London Medico-Chirurgical Society

The discussion on recent advances in rheumatism which was being held by this society on April 1st has been postponed. It will take place at the De Vere Hotel, Kensington, at 7.45 P.M., on April 8th, and the speakers will include Dr. J. F. Halls Dally, Dr. W. S. C. Copeman, and Dr. C. B. Dyson.

Children's Minimum Council

On March 30th Lord Horder will take the chair at a luncheon which is being held by this council in the refectory of the London School of Economics at 1 P.M. The menu will be based on the diet recommended by the B.M.A. nutrition committee in 1933 as the minimum necessary for health, and the wife of an unemployed man will describe how she actually balances her budget. Tickets for the luncheon may be had from the secretary of the council, 72, Horseferry-road, London, S.W.1.

Society of Public Analysts

The next meeting of this society will be held on Wednesday, April 6th, at the chemical society's rooms, Burlington House, Piccadilly, London, W., at 8 P.M. Mr. H. E. Cox, D.Sc., will read a paper on the chemistry and analysis of hernia, Miss Janet Matthews, Ph.D., on microchemical investigations on siliceous dusts, and Mr. W. D. Raymond on the detection and determination of ouabain and strophanthin.

St. Mark's Hospital

At the annual meeting of this hospital on March 17th the Lord Mayor of London, who presided, said that the nurses' home was nearing completion, and would be opened by the Princess Royal on May 5th. It was proposed to convert the space vacated in the hospital by the nurses into a self-contained block for paying patients, and to provide a second operating theatre and additional public beds. The pathological, cancer research, X ray, and out-patient departments would also be enlarged and brought up to date. The cost of this work would be approximately £50,000, half of which had already been received or promised, and an urgent appeal was being made so that the work would be completed free of debt. Mr. L. E. Norbury, honorary surgeon to the hospital, said that the waiting list of patients was the longest in his recollection of the hospital, and amounted to some 400. The greatest care, however, was taken not to keep a cancer patient waiting, and all but one of the 400 were non-cancer cases. The annual report stated that during last year just upon one thousand patients had been admitted to the hospital, and 1115 operations performed. For carcinoma of the rectum 142 cases were admitted, nine of which were readmissions for recurrence. The operability rate was 64·3 per cent. Of the operations, perineo-abdominal excision was performed in 59 cases, perineal excision in 19, and abdomino-anal excision in 2. Of carcinoma of the colon 19 cases were admitted, 10 of which were operable.

Naval Medical Compassionate Fund

A meeting of the subscribers of this fund will be held at 3.15 P.M. on April 22nd, at the medical department of the Navy, Admiralty, S.W., to elect six directors of the fund.

Society of Apothecaries

On March 22nd at a dinner of the court of assistants Mr. Montagu Norman presented to the society on behalf of the Bank of England a silver cup to commemorate the mastership of Dr. Arthur Gibbons, who for 18 years has acted as medical officer to the bank.

Royal London Ophthalmic Hospital, Moorfields

The annual dinner of the Royal London Ophthalmic Hospital took place on March 10th at the Langham Hotel, with Mr. A. C. Hudson, consulting surgeon to the hospital, in the chair. In responding to the health of the School the dean, Mr. Charles Goulden, remarked on the flourishing state of the school, the entries being even larger than in 1936. In the year ended October, 1937, 114 new students had been admitted and 77 old students had continued their attendance, besides which instruction had been provided for students from the British Postgraduate Medical School. The examination results had been satisfactory. In the first part of the D.O.M.S., 40 of the 48 successful candidates were Moorfields students, and of the 53 who passed the final examination 43 came from Moorfields. There were 18 entries for the D.O. Oxford, and of the 9 who were successful 8 were students of the hospital. The dean again drew attention to the urgent need of ophthalmology being placed in its proper position in relation to the other branches of medicine by the foundation of a professorship and a suitable team of helpers. Until this was done it was impossible to achieve more in the direction of teaching and training.

Post-graduate Course in Preventive Treatment

With the coöperation of the British Postgraduate Medical School the London Panel Committee in conjunction with the London Public Medical Service has organised a post-graduate course in preventive treatment. The course will consist of six lectures which will include discussion of the following subjects: the prevention and early recognition of skin disorders; the rôle of diet in the causation of disease; postural defects and minor orthopædic complaints; prevention, recognition, and treatment of early tuberculosis; running ears and infected sinuses in children. The lectures will be given at the British Postgraduate Medical School, Ducane-road, W.12, on April 7th, 14th, 21st, 28th, May 5th and 12th at 3 P.M. The fee will be one guinea. A preliminary lecture will be given by Dr. Harry Roberts at B.M.A. House, Tavistock-square, W.C., on March 30th, at 3 P.M., which will be open free of charge to all insurance practitioners in London and members of the London Public Medical Service. The lecture will summarise the course and a discussion will follow on the preventive aspect of medical practice. Those who propose to attend either the course or the lecture should write to Dr. C. L. Batteson, 17, Russell-square, London, W.C.1, as soon as possible.

The Medical Superintendents' Society

Dr. W. D. Feldman presides this year over the society and took the chair at the annual dinner held on March 19th at the Langham Hotel, London, W. Dr. James Fenton, president of the Society of Medical Officers of Health, proposed the toast of the Society. He called attention to the remarkable improvement made during the last 10 or 12 years in municipal hospitals where the work done was now equal to if not sometimes better than that in voluntary hospitals. Whereas the voluntary hospitals of London owned 13,000 beds, there were 100,000 under municipal control. Voluntary hospitals were more in the limelight because they had to devise means to procure funds which in municipal hospitals were provided by ratepayers. In general it could be said that whatever was needed for the diagnosis and treatment of patients in these hospitals could be obtained without difficulty. Vast opportunities for fruitful research presented themselves in municipal hospitals, and it was to be hoped that advantage would be taken of them. Close association between the society and that of the medical officers of health was desirable and the arrangement of joint meetings would help to promote good understanding. The president in response welcomed the suggestions for coöperation. The privilege of teaching students had now been extended to municipal hospitals to the great advantage of all parties to the arrangement. Dr. H. O. West proposed the toast of the visitors in graceful terms and Dr. D. C. Norris, president of the Hunterian Society, responded with a tribute to the energy and imagination with which the reform of the municipal hospitals had been carried out. Between the speeches Mr. Finlay Dunn and Mr. Victor Peacock entertained the company, whose enjoyment of the friendly domestic atmosphere of the dinner party was evident.

Medical Diary

March 28th to April 3rd

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY.

Odontology. 8 P.M., Mr. S. A. Riddett: (1) Tumour of the Palate. Mr. Percival Cole: (2–4) Pedicle Bone Graft for Fractured Mandible. Mr. J. G. Turner: (5) Spread of Caries. (6) Enamel Hypoplasia. Mr. Frank Coleman: (7) Fracture of Mandible. (8) Cyst of the Mandible. (9) Extra Molar Tooth. Mr. H. O. Dickin: (10) Dental Models Illustrating Development under Treatment by Means of Oral Screens. Mr. F. N. Doubleday: (11) Widening of the Aperture of the Mouth. (12) Hypertrophic Gingivitis treated without Operation. Mr. A. L. Packham: (13) Unilateral Fibrous Ankylosis of Right Temporo-mandibular Joint in a Child of 8 years. Mr. W. Warwick James: (14) An Old Fracture of the Mandible. (15) Necrosis of the Mandible.

FRIDAY.

Anæsthetics. 8.30 P.M., Dr. C. L. G. Pratt: Some Physiological Points of Importance in Anæsthesia.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.

MONDAY.—8.30 P.M., Dr. James Maxwell and Mr. R. C. Brock: Diagnosis and Treatment of Lung Abscess.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF GLASGOW.

TUESDAY.—4.30 P.M. (Tennent Memorial Building, Church-street), Dr. John Marshall: Diseases of Eyelids, Conjunctiva, and Cornea.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland-place, W.

WEDNESDAY.—3.30 P.M., Dr. Leonard Findlay: The Family as a Unit in National Health.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

MONDAY.—2.30 P.M., Sir Edmund Spriggs: Diseases of Small and Large Intestine.

WEDNESDAY.—Noon, clinical and pathological conference (medical). 3 P.M., clinical and pathological conference (surgical). 4.30 P.M., Prof. C. R. Harington, F.R.S.: The Thyroid and its Secretions.

THURSDAY.—2.15 P.M., Dr. Duncan White: radiological demonstration. 3.30 P.M., Dr. T. N. MacGregor: Hormone Therapy in Gynæcology. 4.30 P.M., Mr. Kenneth Walker: Venereal Diseases.

FRIDAY.—2 P.M., clinical and pathological conference (obstetrics and gynæcology). 2.30 P.M., Mr. Geoffrey Keynes: Diseases of the Breast.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 31st.—2 P.M., Dr. Wilfred J. Pearson: Infant Feeding: on the Bottle. 3 P.M., Mr. Eric Lloyd: Knock-knee.

Out-patient clinics daily at 10 A.M. and ward visits at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY.—3.30 P.M., Dr. C. P. Symonds: Cerebral Tumours.

TUESDAY.—3.30 P.M., Dr. F. M. R. Walshe: Progressive Muscular Atrophy.

WEDNESDAY.—3.30 P.M., Dr. Walshe: clinical demonstration.

THURSDAY.—3.30 P.M., Dr. Denis Brinton: Vascular Disease of the Nervous System.

FRIDAY.—3.30 P.M., Dr. E. A. Carmichael: The Myopathies.

Out-patient clinic daily at 2 P.M.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, W.

TUESDAY.—5.30 P.M., Dr. J. M. H. Campbell: Aortic Disease.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY.—4 P.M., Mr. J. D. McLaggan: Tuberculosis of the Larynx.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.

WEDNESDAY.—4 P.M., Dr. C. Rickword Lane: The Blood Sedimentation-rate.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY to SUNDAY.—ROYAL CHEST HOSPITAL, City-road, E.C., Mon., Wed., and Fri. at 8 P.M., advanced course in chest and heart diseases (open to non-members).—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., afternoon course in neurology.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W., Tues., 8.30 P.M., demonstration on fundus oculi.—ROYAL EYE HOSPITAL, St. George's-circus, S.E., afternoon course in ophthalmology.—PARK HOSPITAL, Hither-green, S.E., Sat. and Sun., course in fevers.

ST. JOHN CLINIC AND INSTITUTE OF PHYSICAL MEDICINE, Ranelagh-road, S.W.

FRIDAY.—4.30 P.M., Dr. A. P. Cawadias: Physical Medicine in Metabolic and Gastro-intestinal Diseases (2).

MANCHESTER ROYAL INFIRMARY.

FRIDAY.—4.15 P.M., Dr. Fergus R. Ferguson: clinical demonstration.

ANCOATS HOSPITAL, Manchester.

THURSDAY.—4.15 P.M., Dr. Arnold Renshaw: Certain Poisons: their Mode of Detection.

LEEDS GENERAL INFIRMARY.

TUESDAY.—3.30 P.M., Mr. Digby Chamberlain: Carcinoma of the Stomach.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.

WEDNESDAY.—4.15 P.M. (Western Infirmary), Dr. J. G. Macgregor-Robertson: Venereal Disease in Men.

Appointments

BELL, A. L. W., F.R.C.S. Edin., Resident Surgical Officer at St. John's Hospital, Lewisham.

BUTTERS, A. G., F.R.C.S. Edin., Resident Surgical Officer at the King Edward VII Hospital, Windsor.

BUXTON, ROBERT, M.B. Camb., D.O.M.S., Hon. Ophthalmic Surgeon to the Weston-super-Mare General Hospital.

CARSON, J., M.B. Edin., Second Assistant Medical Officer to the Brighton County Borough Mental Hospital, Haywards Heath.

CROWLEY, TIMOTHY, M.B. Edin., Assistant Medical Officer at the Royal Eastern Counties Institution, Colchester.

HUNTER, DONALD, M.D., F.R.C.P. Lond., Hon. Physician to the London Hospital.

KENNEDY, D. P., M.B. Dubl., F.R.C.S. Irel., Assistant Medical Officer at Southlands Hospital, Shoreham-by-Sea.

NAPIER, F. J., M.R.C.S. Eng., D.P.M., Deputy Medical Superintendent at the Leicestershire and Rutland Mental Hospital, Narborough.

PROBERT, WINIFRED E., M.R.C.S. Eng., D.P.H., Assistant Medical Officer for Monmouthshire.

SAWYER, G. C., M.B. Lond., F.R.C.S. Eng., Surgical Registrar at Charing Cross Hospital.

London County Council.—The following appointments have been made to the council's pathological service:—
BARBER, MARY, M.B. Lond., Archway Hospital;
BODOANO, AGNES M., M.B. Manch., L.M. Dubl., Lewisham Hospital;
GLASS, VLADIMIR, M.B. Lond., St. Mary Abbots Hospital;
KAY, W. W., M.Sc., M.B., Manch. Archway Hospital; and
GIBSON, ANNE, M.D. Edin., Lambeth Hospital.

Certifying Surgeons under the Factory and Workshop Acts: Dr. H. ADDISON (Thirsk District, York, N.R.); Dr. J. S. MACBETH (Kibworth District, Leicester).

Vacancies

For further information refer to the advertisement columns

Accrington, Victoria Hosp.—H.S., £175.
Ashton-under-Lyne, District Infirmary.—Res. Surg. O., at rate of £200.
Ashton-under-Lyne, Lake Hosp. and Darnton House Institution.—Sen. and Jun. Res. M.O.'s, £250 and £225 respectively.
Aylesbury, Royal Buckinghamshire Hosp.—Sen. and Jun. Res. M.O.'s, at rate of £200 and £150 respectively.
Bedford County Hosp.—H.S., at rate of £155.
Belgrave Hosp. for Children, Clapham-road, S.W.—Two H.P.'s and one H.S., each at rate of £100.
Birmingham City Education Committee.—Two Asst. School M.O.'s, each £500.
Birmingham and Midland Eye Hosp.—H.S., at rate of £130.
Blackburn County Borough.—Asst. M.O.H. and Asst. School M.O., £600.
Bolton Borough Isolation Hosp.—Res. Asst. M.O., £450.
Bradford Royal Infirmary.—Five H.S.'s, each at rate of £150.
Brighton, Royal Sussex County Hosp.—Cas. H.S., £120.
Bristol City and County.—Asst. M.O.H., £500.
Bristol Eye Hosp.—Jun. H.S., at rate of £100.
British Postgraduate Medical School, Ducane-road, W.—H.S., £105.
Buxton, Devonshire Royal Hosp.—Res. M.O. or H.P., at rate of £200 and £150 respectively.
Charing Cross Hosp., W.C.—Cancer and Radium Registrar, £100.
Chester, Barrowmore Tuberculosis Sanatorium and Settlement, Great Barrow.—Jun. Asst. M.O., at rate of £200.
Chester Royal Infirmary.—H.S., £150.
Derbyshire County Council.—Asst. Maternity and Child Welfare M.O., £600.
Derbyshire Royal Infirmary.—H.S. for Ear, Throat, and Nose Dept., £150.
Dorchester, Dorset County Hosp.—H.S., at rate of £150.
Dudley, Guest Hosp.—H.S., £100–£130.
Eastbourne, Princess Alice Hosp.—Res. H.S., £150.
Edinburgh, Gogarburn Certified Institution, Corstorphine.—Asst. M.O., £300.
Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Clin. Asst. to Ophthalmic Dept. Out-patients, £50. Also Hon. Asst. Anæsthetist, £10.
Evelina Hosp. for Sick Children, Southwark, S.E.—H.S., at rate of £120.
Exeter, Princess Elizabeth Orthopædic Hosp.—Res. H.S., at rate of £150.
Guildford, Royal Surrey County Hosp.—Res. Surg. O., £250.
Harefield, County Sanatorium.—Visiting Anæsthetist, 3 guineas per session.
Holland (Lincs) County Council.—Asst. M.O.H., £600.
Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. and Out-patient Aural Registrar, £200 and £175 respectively. Also two H.P.'s and two H.S.'s, each at rate of £50.
Hosp. of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S., at rate of £75.
Hove General Hosp.—Jun. Res. M.O., at rate of £120.
Huddersfield County Borough.—Asst. M.O.H., £500.
Hull Royal Infirmary.—Second H.P., at rate of £150.
Ilford, King George Hosp.—H.S., at rate of £100.
Infant Hosp., Vincent-square, Westminster.—Clin. Assistantships.
Ipswich, East Suffolk and Ipswich Hosp.—Cas. O., £144.
King Edward Memorial Hosp., Ealing.—H.S., at rate of £150.
Leeds, St. James's Hosp.—H.P.'s and H.S.'s, each at rate of £150.
Leicester City General Hosp.—Res. M.O., at rate of £300.
Leicester City Mental Hosp.—Asst. M.O., £350.
Liverpool City.—Jun. Asst. Bacteriologist, £400.
Liverpool, St. Paul's Eye Hosp.—H.S., at rate of £145.
London Chest Hosp., Victoria Park, E.—H.P., at rate of £100.
London County Council.—Sen. Asst. M.O. (Grade II), £500. Also Asst. M.O.'s (Grades I and II), £350 and £250 respectively.
London Hosp., E.—Clin. Asst. in X Ray Dept., £100.
London Lock Hosp., 283, Harrow-road, W.—Res. M.O., at rate of £175.
Maidstone, West Kent General Hosp.—H.S., £175.
Manchester, Ancoats Hosp.—Res. Surg. O., £200.
Manchester Royal Eye Hosp.—H.S., £120.
Manchester Royal Infirmary.—M.O. to Out-patients, £105.
Mansfield, Harlow Wood Orthopædic Hosp.—Surg. Reg., £450. Also H.S., at rate of £200.
National Hosp. for Diseases of the Heart, Westmoreland-street, W.—Res. M.O., at rate of £150.
National Temperance Hosp., Hampstead-road, N.W.—Cas. O. and H.S., at rate of £120 and £100 respectively.
Norwich City.—Asst. M.O.H., &c., £600.
Nottingham City.—Asst. M.O. for Maternity and Child Welfare, £500.
Nottingham General Hosp.—H.P., at rate of £150.
Nottingham, Mapperley Hosp.—Locum Tenens M.O., 7 guineas per week.
Oxford University.—First Asst. in Dept. of Clin. Medicine, £600.
Paddington Green Children's Hosp., W.—H.P. and H.S., each at rate of £150.
Plaistow Fever Hosp.—Jun. Asst. M.O., £300.
Plymouth City Isolation Hosp.—Asst. Res. M.O., £300.
Portsmouth Education Committee.—Asst. M.O.H. and Asst. School M.O., £500.
Preston, Biddulph Grange Orthopædic Hosp.—Asst. Visiting Orthopædic Surgeon, £250.
Queen's Hosp. for Children, Hackney-road, E.—Cas. O., £100.
Reading, Royal Berkshire Hosp.—H.S., H.P., and H.S. to Special Depts., each at rate of £150.
Richmond Royal Hosp., Surrey.—Jun. H.S., £100.
Royal Air Force Dental Branch.—Dental Surgeons.
Royal Army Medical Corps.—Commissions.
Royal Free Hosp., Gray's Inn-road, W.C.—Res. Cas. O., £150.
Royal London Ophthalmic Hosp., City-road, E.C.—Out-patient O., £100.
Royal Naval Medical Service.—Medical Officers.
St. Bartholomew's Hosp., E.C.—Part-time Chief Asst. in X Ray Diagnostic Dept.
St. Paul's Hosp. for Urological and Skin Diseases, Endell-street, W.C.—H.S., at rate of £100.
Salisbury General Infirmary.—H.S., at rate of £125.
Salop County Council.—Asst. M.O., £500.
Sheffield, Wadsley Mental Hosp.—Asst. M.O., £350.
Stirling District Mental Hosp., Larbert.—Jun. Asst. M.O., £300.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—H.S., at rate of £150. Also Res. Anæsthetist, £150.
Swansea General and Eye Hosp.—H.P., at rate of £150.
University of London, University College, W.C.—Bucknill Scholarship, 160 guineas. Also two Exhibitions, each 55 guineas.
Windsor, King Edward VII Hosp.—Hon. S. for Ear, Nose, and Throat Dept.
Wolverhampton, New Cross Hosp.—Res. Asst. M.O., £200.
Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—Res. M.O., £150. Also H.S., at rate of £100.
Worcester Royal Infirmary.—Jun. H. S., £120.
York City.—Asst. M.O.H., at rate of £350.
York County Hosp.—H.S., £150.

NOTES, COMMENTS, AND ABSTRACTS

THE SUBURBAN NEUROSIS

By Stephen Taylor, M.B., M.R.C.P.
SENIOR RESIDENT MEDICAL OFFICER, ROYAL FREE HOSPITAL

Those whose duty it is to deal with the "poor teaching cases" in the medical out-patient departments of the great London hospitals soon find that most of their patients fall into a few large but not very clear-cut groups. First come the menopausal osteo-arthritics, with or without hypertension and early signs of congestive failure. Then there are the chronic bronchitics and patients with long-standing indigestion, in whom no definite lesions, beyond a few rhonchi or a little tenderness, can be discovered. Finally, there are the great concourse of neurotics, some well hospitalised and saturated with the not very efficacious mixtures intended for their more organic friends, others, less regular visitors as a rule, scarcely to be distinguished from early cases of Graves's disease.

After four years of such work, I have gained the impression that, among the neurotics, there has been a decline in the number of simple old "bottle-of-medicine" loving patients, their places being taken by less poverty-stricken young women with anxiety states, the majority of whom present a definite clinical picture with a uniform background. It is my aim here to describe that picture—not in academic terms, but in the words of the patients themselves—and to throw a little light on that background. I hope to show that environment plays no less a part in the production of what I venture to call "the suburban neurosis," than it does in the production of physical disease.

CLINICAL PICTURE

Mrs. Everyman is 28 or 30 years old. She and her dress are clean, but there is a slovenly look about her. She has given up the permanent wave she was so proud of when she was engaged. Her clothes, always respectable and never as smart as those young hussies who work in the biscuit factory, are, like her furniture, getting a little shabby. They hang on her rather as a covering than as something to be worn and made the most of. She is pale but not anæmic. Her hæmoglobin is 86 per cent. She has left the child outside in the waiting-room. As she sits down I notice that her hands are shaking.

"I've been to my own doctor," she begins, "but he gave me a bottle of medicine and told me it was nerves. I wasn't satisfied, so I've come to see you. It can't be nerves, doctor; I feel such a . . ." Then follows the principal symptom. Here are a few of them:—

Lump in my throat that goes up and down, or round and round.
Trembling all over, and I jump at the slightest noise.
Continuous gnawing, nagging headache.
Stabbing pains over my heart.
Pain in my back which runs up and down.
My stomach swells up terribly.
Nasty taste in my mouth.
So short of breath when I hurry.
Terrible buzzing in my ears.
I can't sleep at night.
I'm getting ever so thin. . . .
And so on.

Whatever the principal symptom, several of the others are certain to be there as subsidiaries.

On examination, there is a definite but variable tremor, a definite but variable tachycardia, pendulous flabby breasts, poor abdominal muscles, very brisk reflexes, and nothing else. Watched over two months, she will gain or lose a pound. She will show no exophthalmos, no goitre, and neither hyper- nor hypotension.

All too often at the top of her notes will be written "N." or "HYS."; she will receive perhaps a bottle of Mist. Pot. Brom. Co.; she will be referred on to the junior assistant, who will in due course write "Rep." on her treatment sheet—and she will be forgotten.

THE TRUE HISTORY

Her parents were respectable, and kept themselves to themselves. After school, she went to a shorthand college, and from there to a business house in Brixton. All day she added up figures, in the train she skimmed the *Daily Peepshow*, three times a week she went to the cinema, and such mind as school had developed withered and retrogressed. Then love, in the shape of Mr. Everyman, came along. He, too, was a clerk in the Brixton business house. And the boss, who knew enough of human nature to agree with Bacon—"He that hath wife and children hath given hostages to fortune; for they are impediments to great enterprises, either of virtue or mischief"—liked to see his young men married.

So, after two years of saving, and those lovely walks around Box Hill at the week-ends, they took the plunge into a small semi-detached hire-purchase villa on the wonderful new Everysuburb estate, adjacent to one of our great by-passes and only twenty minutes from the station. The estate was Mr. Jerrybuilder's fifth successful venture in the property market. By this time he had thoroughly mastered the technique of using the cheapest unseasoned timber, the lightest of breeze brick, and the smartest of bathroom fittings.

All their savings went on the first instalments on the house and furniture. Mr. Everyman was an inexperienced lover, and the physical side of marriage shocked and disappointed his wife. After a year of rather unsatisfactory birth control, during which time the thrill of a "home of her own" had worn off, they decided to risk a baby. In due course baby came, and for about a year and a half kept Mrs. Everyman's hands pretty full. Then things began to slacken up. She had developed a routine for doing the housework quickly. She had to think a little about the shopping, but the cooking she did almost blindly. The *Peepshow* didn't take long to read, and the wireless was always the same old stuff. They hadn't been able to get away for a holiday as they had hoped; baby had cost more than they bargained for. Hubby had started to grumble at her. Then baby had been a bit fretful lately. She couldn't understand it. She'd been so careful with him. He couldn't have picked up anything. She hadn't let him mix with other children.

One day there had dropped in through the letter-box a circular. It was sent out by the local doctors, and it was all about cancer. It said cancer did not hurt at first, and if you took it early it was all right. "Took it early." That meant an operation. It was bad enough when baby came, but an operation! Then she remembered that pain in her back. She'd noticed it at first when she was doing the housework, and she thought she must have strained herself. But it had stayed on. Cancer didn't hurt *at first*. Her back was hurting. What if it were? And she was losing weight, too. Hadn't hubby said she wasn't as nice to cuddle as she used to be? What if she did get ill? Not cancer, but just something she had to go into hospital with. Baby would have to go to mother's, and *she* didn't want him. And hubby's cousin would have to come and look after him. That woman! She never had liked her—didn't trust her really. The way she looked at men. Just as though she wanted to eat them.

Suppose hubby should lose his job—or get ill. Then what? They'd fall behind with the instalments.

Then they'd take the furniture. And they'd have to live in rooms—or take a lodger. Perhaps they couldn't get one. You never saw notices up in Acacia-row with "Bed and Breakfast. Gent preferred" on them, like you did in London. What would the neighbours say?

If only she'd got someone to talk to. Somehow she couldn't tell hubby. He'd say she was just being silly. They'd been there three years and she only knew three people on the estate. There were the neighbours, but you couldn't call them neighbourly. And that Mrs. Smith in Paradise-avenue, who'd asked her round to tea. Then, when she found she couldn't play cards, she'd not asked her any more. The curate had called once, when hubby was at work. Quite a nice young chap. He'd asked her to come to the Church social. But hubby had said no. And anyhow, you couldn't believe in religion much nowadays. Not with the newspapers, and all this war, and gas-masks for babies.

Then hubby did get ill—neuritis. Sciatica, the doctor had called it, and they'd had to get a plaster for it, and she'd been so busy she didn't know what to do. Her pain hadn't been so bad then. In fact, she'd forgotten about it altogether. She'd been sleeping better, too. None of that horrid sex business either. She'd just cuddled up close to him and known it was all right. The boss had been decent about it, and they'd managed the money somehow, and in six weeks the doctor said he could go back to work.

Then that pain had started all over again, worse than ever; she couldn't stick it. The house was getting her down. If only they could move to a little flat somewhere, with real live people all around. When would the instalments finish? Only twenty-one years, Mr. Jerrybuilder had said. 1956—Oh God!

After weeks and weeks of it, she'd plucked up courage and gone to the doctor, and he'd said it was nerves! Nerves—what had she got to be nervous about? Why, when hubby was bad, she'd been as right as rain. But there it was, nag, nag, nag. She'd take something, that's what she'd do. Or put her head in a gas-oven. No, it was too horrible. She couldn't face that. She'd try the hospital instead.

And so at last to "minor medical out-patients"—and me.

ÆTIOLOGY

Let me translate this miserable little story into medical jargon. The deep-seated ætiological factors of the suburban neurosis are, no doubt, extremely complex. The stomach which swells represents perhaps an unconscious urge to further motherhood, the sleepless nights a longing for a full sex life. Existence in the suburbs is such that the self-preserving, race-preserving and herd instincts can be neither adequately satisfied nor sublimated. The barriers to satisfaction and sublimation are the superficial or "trigger" causes of the condition, while the symptoms—pathological anxiety, somatic manifestations, failure of conation, and failure of affect—represent a side-tracking of the frustrated emotional energy.

The superficial causes are as follows:—

1. *Boredom*, occasioned by—

(a) *Lack of friends.*—Few who have not worked or lived in the suburbs can realise the intense loneliness of their unhappy inhabitants. There is no common meeting-ground like the pub and the street of the slum dwellers, and the golf and tennis club of the upper-middle classes. There is no community of interest such as is found in the village. Lack of individual enterprise, shyness, and bashfulness prevent calling, and the striking up of friendships. It is respectable to keep oneself to oneself. The Englishman's home is still his castle, but for the Englishwoman too often it is her gaol.

(b) *Not enough to do.*—As long as the housework, the baby or the sick husband keep the young wife busy, all is fairly satisfactory. But once these cease to occupy her she is left with time on her hands, and she starts to think, a process for which she is completely unadapted.

(c) *Not enough to think about.*—At school she was not taught to use her brain for her own amusement. Since then, all the stimuli reaching her not very adequate cerebrum have been designed to inhibit rather than to stimulate thought. The papers she reads and the films she sees are all of the "flash-in-the-pan" wish-fulfilment variety. The wireless, of necessity, dare not be provoking. She has no knowledge of what books to read, nor how to set about getting them. The wisdom of the world, if she did but know it, is waiting for her on the station book-stall, at sixpence a time.

2. *Anxiety.*—Anxiety is of two great kinds—justifiable and unjustifiable. To be anxious in an aeroplane is still justifiable. To be anxious in a railway train is not. This dogmatic statement requires qualification. A Solomon Islander riding in his first train would be justifiably anxious. Justifiable anxiety may vanish or become unjustifiable in the face of knowledge and experience. Unjustifiable anxiety is pathological, and is ready to attach itself to the most commonplace events. It is, of course, a psychoneurotic symptom.

The patient suffering from the suburban neurosis shows both kinds of anxiety, though unjustifiable anxiety is symptomatic rather than causative. Our patient is justifiably anxious about—

(a) *Money and the house.*—Her little family is not merely living in a hand-to-mouth way. It has taken on commitments which tie it for the next twenty-one years. By the time the payments on the house and furniture are completed, the value of both will be very much less than the amount paid for them. In fact, they may actually be unrealisable. Prolonged sickness, or the loss of a job on the part of the wage-earner may mean the loss of such savings as the instalments paid represent, the break-up of the home, and the disappearance of "respectability." Further, if the house should prove unsuitable or unsatisfactory—as it probably will—the chances of getting out of it are extremely remote.

(b) *Another baby.*—The safest forms of birth control are physically the least satisfactory. But even if only the safest forms are used, there is always the possibility of an accident, and another child would just push the family budget over to the wrong side. This fear is extremely common in the one-child family.

3. *A false set of values.*—The suburban woman has made a fetish of the home. She is aiming at the kind of life successfully led by people to whom books, theatres, and things of the intellect matter. To them, the home is a necessary part of life, but only a part. To her, because she does not see the rest, the home looks like everything, and she wonders why it does not bring her the happiness it appears to bring to them.

The other set of values she is offered is that of the *Daily Peepshow* and the weekly cinema. In both, she sees continuous "tempests of emotion"—uncouth marriages of elderly clergymen to young parishioners, torsos daily discovered in trunks, romatic love triumphing over New York's press men, and plumbers made rich beyond dreams by Saturday's football pools. One cannot blame her for expecting at least a little of other people's thrills. But there *is* no thrill in Everysuburb.

SYMPTOMATOLOGY

The presenting symptom is usually somatic, but a greater or lesser degree of unjustifiable anxiety is always present as well. It may crystallise out as fear of cancer or of the baby's ill health, or, rarely, of the husband's unfaithfulness. Reassurance on any of these scores, unaccompanied by further treatment, will simply cause it to attach itself to some new object.

The paralysis of feeling and striving resembles, in a small way, that seen in melancholia. I believe the failure of affect to be both symptomatic and causative—a vicious circle which feeds upon itself. The objects of the emotions are gradually seen through, and the emotions themselves begin to lack conviction. Physical love is a disappointment, the husband turns out to be rather ordinary and grumpy, the house is seen for what it is, a tawdry jerry-built box, and even the child is not as wonderful as was hoped. "After all," the wife says, "you can't go on feeling when things aren't worth feeling about."

The same applies to the failure of conation. The loss of urge to strive is combined with a very reasonable appreciation of the hopelessness of striving. The decline in religious faith, without a corresponding growth of any of the new state creeds (communism, fascism, &c.) has left a great part of the population without any raison d'être, or any positive ideal towards which to work. This does not matter so much, provided the individual concerned has little time on his or her hands. But the small, labour-saving house, the small family, and the few friends have left the women of the suburbs relatively idle. They have nothing to look forward to, nothing to look up to, and little to live for.

It will be seen that ætiology and symptomatology overlap, and that superficial ætiological factors make a formidable list before which the finest minds might quail. What wonder that the underdeveloped, relatively poor mind of the suburban woman seeks an escape in neurosis?

No doubt the roots of these neuroses lie buried deep in a heap of infantile and adolescent manure. But without the stimulus of the superficial factors, these roots do not bear fruit. It is only when the environment fails so hopelessly that the neurosis becomes manifest. And when the environment gives at least a little satisfaction—the sick husband, the busy day, the new baby—the symptoms once more vanish.

TREATMENT AND PROPHYLAXIS

If it were possible to establish on each new estate a team of psycho-analysts, the suburban neurotics might learn to see themselves as they are, and carry on and even reconstruct their unsatisfactory lives without developing symptoms. It is hard, however, to imagine a more inverted way of doing good—or, for that matter, a more costly one.

The treatment of the individual case is beset with difficulties. It calls for enthusiasm and perseverance. At the start a complete physical examination, followed by unqualified reassurance, is essential. One must attempt to reawaken interest in life. A club of some kind, or a pub, is a great help, but all too often neither is available, or the pub is by unwritten law for men only. A carefully graded reading list is perhaps of more use than a bottle of medicine. Another baby, rather than a new wireless, if it can be afforded, may effect a permanent cure. If the house can be disposed of, a flat near a few friends may work wonders. But all too often one finds oneself up against a deadlock of unpleasant and hopeless reality. The psychological out-patient department is in most hospitals already overcrowded, so one attempts a very superficial analysis. Gross physical difficulties in the sex life are straightened out, but the neurosis persists. And as long as life offers the suburban woman so little to live for, so long will she continue at last to pluck up her courage and add to the numbers in our out-patient waiting halls.

We have, I fear, let matters go too far in the jerry-building, ribbon-development line to institute an entirely satisfactory scheme of prophylaxis. We have allowed the slum which stunted the body to be replaced by a slum which stunts the mind. Perhaps, like a pack of cards, these rotten little houses will in due course collapse. Perhaps, when the children grow up, they will break down the barriers which separate family from family. But even this hope may prove false. Instead, the child may see through the values of its family and come to despise it. Or its over-proud parents may push it into a job for which it is intellectually unqualified—and one more neurotic will be launched on its way.

Meanwhile, our best plan is, I think, to establish on these new estates social non-religious clubs, catering for all possible interests. Under one roof one would like to see a swimming bath and gymnasium, a cafeteria, a day nursery, the public library, and reading, smoking, and games rooms—something not unlike the Pioneer Health Centre at Peckham, without perhaps such a positive emphasis on health as the main motive of life. Such a club would give the suppressed herd instinct of the unhappy inhabitants of the Everysuburb estate a chance to express itself. And in a corporate life, affect and conation would find new outlets. It has been suggested that these new communities will only develop a true corporate sense with some revival of individual local leadership, analogous to the old village squirarchy. Perhaps the success of the totalitarian states with their lower-middle classes is due to just such a reassertion of the "Leader Principle."

The prevention of the suburban neurosis, then, is in the hands of the social workers and politicians. And if they require a purely selfish stimulus, one would remind them that, in the latent feelings and strivings of the new mental slum-dwellers, there is waiting a most hopeful field for the teachers of new, and possibly dangerous, political ideologies.

DRINKING WATER IN AMERICAN TRAINS

THE United States public health service have investigated[1] the purity of the drinking water provided by nine railway companies operating in or near New York City. They took a thousand or more samples from trains which could conveniently be reached during working hours, with no attempt at selection. Each sample was cultivated in five 10 c.cm. tubes and if three tubes gave a growth of the coli-aerogenes group the sample was considered unsatisfactory. Three of the nine companies had considerably more unsatisfactory samples than the others, their figures being 7, 12, and 16 per cent. unsatisfactory, compared with from 0 to 3 per cent. for the remaining six companies. The water supplied to these lines from the mains is known to be pure, so the authorities conclude that at least two companies are cleaning their containers inefficiently or allowing the water to be contaminated through careless handling.

[1] *Publ. Hlth Rep., Wash.* Feb. 25th, 1938, p. 300.

JOHN BRUCE MACCALLUM

A BRILLIANT young American histologist and experimenter, John Bruce MacCallum died of tuberculosis in 1905 at the early age of 29 years. His biography[1] is well worth reading. He was educated at Toronto and at Johns Hopkins where he made many interesting contacts—among others, Osler, Welch, Barker, Simon Flexner, Mall, and the McCraes. While not yet 21 and while an undergraduate in medicine he made a remarkable and still memorable investigation on the histogenesis of the cardiac muscle cell. In spite of continued ill health he had published some two dozen papers by the time of his death, some of them of considerable merit. On leaving Johns Hopkins he went to Denver, Colorado, where it was hoped his health would improve, and he there made an abortive attempt at general medical practice. His comment on this phase of his career was that only one of the three C's—cupidity, crime, or consumption—would drive a man to Denver; so it is not surprising that he soon left it to take up a post with Jaques Loeb, who had recently been appointed to a chair at Berkeley, California. There he did some good work on the general physiology of purgatives. MacCallum undoubtedly had unusual gifts—his teachers, including Osler, looked upon him as something of a prodigy—and he had the charm and appeal that so often characterises the poitrinaire. He was highly temperamental and given to fits of both depression and elation, and his brief life seemed to be lived in "Sturm und Drang." But he was on the whole cheerful and sanguine, and met life in all its angles gladly. MacCallum's letters and his entries in his notebooks, which make up the bulk of Dr. Malloch's volume, make good reading. As Dr. Alfred Cohn notes in a letter to the author, this biography gives a vivid picture of the Toronto and Johns Hopkins schools during a very brilliant period, as well as an account of the life of an able and engaging personality.

AN INJURY OF THE HEART

E. Ortega describes a somewhat unusual case of injury caused by a stab-wound in the precordial region (*Anal. Soc. méd. quir. del Guayas*, 1937, **28**, 205).

The patient, a young man, was admitted to hospital with a history of having been stabbed eight hours previously. On examination a wound was found in the sixth intercostal space, 5 cm. from the midline. The pulse was regular at 120. The apex-beat could not be felt; the heart sounds were distinct. Respiration was shallow and rapid (30 per minute). The abdomen was acutely tender all over, especially in the epigastrium, and rigid. There was dullness in both flanks and in the lower abdomen, and a tympanitic area including the umbilical and epigastric regions. The liver dullness was abolished. The skin and mucous membranes were blanched.

In view of the grave abdominal symptoms an exploratory laparotomy was immediately undertaken under ether anæsthesia. It revealed a large wound in the diaphragm, through which jets of blood escaped at regular intervals into the peritoneal cavity. None of the abdominal viscera was injured.

The abdominal wound was closed as rapidly as possible and the thoracic cavity opened by a flap incision. The pericardial sac was opened, the contained blood mopped out, and the heart examined. In the wall of the right ventricle was a longitudinal wound 2 cm. long, through which formidable bleeding was taking place. Without displacing the heart, three sutures of No. 4 catgut were inserted to close the wound, all three being made to penetrate the cavity of the heart. The wound in the diaphragm was sutured, and the pleural cavity and the parietal wound closed. Stimulants and intravenous salines were given and the patient recovered. He subsequently developed what appeared to be a small pulmonary embolus followed by a patch of pneumonia, and a residual hæmothorax required aspiration; but these were the only complications. The operation wounds healed by first intention and the patient was fit for discharge by the eighteenth day after the accident.

The points of interest in this case are the length of time which elapsed between the accident and the successful operation, despite the large size of the wound in the heart; and the predominance of symptoms of "acute abdomen."

SPEECH TRAINING IN CLEFT PALATE CASES

THE surgeon who has repaired a cleft palate feels some responsibility for the functional end-result of his work. Two little books recently published on the subject of speech training are worth his notice. Mr. M. C. Oldfield[1] gives detailed instructions for the production of sounds of the various vowels and consonants and these are accompanied by illustrations of the respective position of the tongue, palate, and lips. He praises the pioneer work of Freda Parsons and Joan van Thal and their influence can be traced in the text of this well-illustrated introduction to speech training.

Mr. Pickerill's book[2] has been written for the use of patients themselves or their guardians. The subject matter is for lay consumption. Brief answers are provided to such questions as "What exactly is a cleft palate?" "Why did the two sides not join?" "Is the condition hereditary?" which even if not put into words are always in the minds of those troubled by the presence of a congenital defect of this sort. A mother whose child has a cleft palate will be glad of this book, especially if the facilities of a speech training clinic are not available.

MUNICIPAL YEAR BOOK

THE 1938 edition of the Municipal Year Book and Encyclopædia of Local Government Administration[3] is the biggest since the volume was founded in 1897. It is divided into fifty sections, and there is a comprehensive survey of local government developments in 1937, followed by a review of all the principal law cases of last year affecting local government, and details of the chief legislation of the last Parliamentary session. There are sections on housing, town and country planning, public health services, parks and open spaces, sewage disposal, public cleansing service, and water-supply. The first review of county districts under the Local Government Act, 1929, has made many changes in the urban and rural districts of the country, and these are all noted in this new volume. Sir Kingsley Wood, the Minister of Health, contributes a general preface.

AT their new house, 2, Bentinck-street, W.1, Messrs. AMPLIVOX LTD. will have available for demonstration every form of hearing device from post-office amplifier to silent bell systems. Medical men are invited after April 4th to inspect these instruments.

ERRATA.—The reference in a footnote on p. 210 of our issue of Jan. 22nd should run as follows:—

[3] Elliot, M. M., Nelson, E. M., Barnes, D. J., Browne, F. A., and Jenss, R. M., *J. Pediat.* 1936, **9**, 355.

IN the article by Dr. E. D. Hoare, published in THE LANCET of March 19th, line 3 of the heading of Tables I to VI (p. 656) should read SC = SULPHAMIDE-CHRYSOIDINE.

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[1] Short Years. The Life and Letters of John Bruce MacCallum, M.D., 1876–1906. By Archibald Malloch. Chicago: Normandie House. 1938. Pp. 343. $3.50.

[1] Speech Training for Cases of Cleft Palate. By M. C. Oldfield, M.Ch. Oxon., F.R.C.S. London: H. K. Lewis. 1938. Pp. 20. 4*s*. 6*d*.

[2] Speech Training for Cleft Palate Patients. By H. P. Pickerill, C.B.E., M.D., M.S., F.R.A.C.S. London and New Zealand: Whitcombe and Tombs. 1938. Pp. 36. 4*s*. 6*d*.

[3] Published by the Municipal Journal, Ltd., 3 and 4, Clement's Inn, Strand, London, W.C.2. Pp. 1712. 30*s*.